

January-February 2011

A Joint
Professional
Bulletin

for U.S. Field
and Air Defense
Artillerymen

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100 Years of Fires

Commemorative Edition

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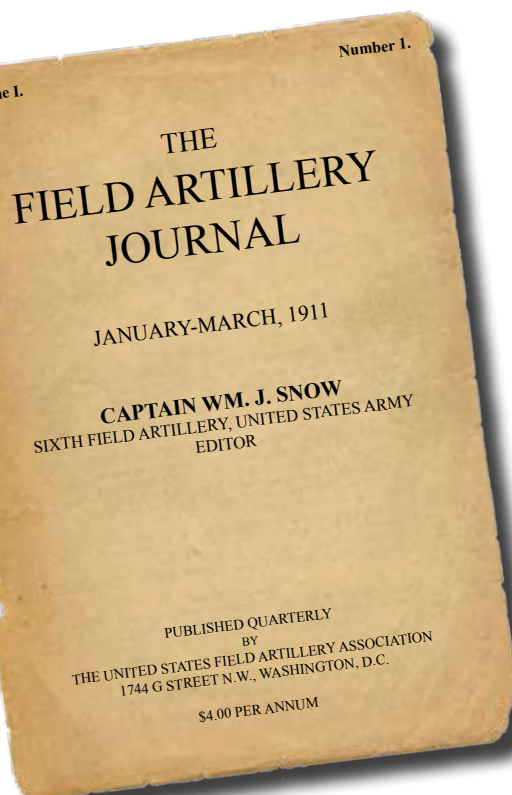
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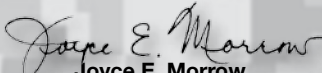
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Select articles from *The Field Artillery Journal's* first edition

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PURPOSE: Founded in 2007, *Fires* serves as a forum for the professional discussions of U.S. Army and Marine Field Artillery (FA) and Army Air Defense Artillery (ADA) professionals, both active and Reserve Component (RC); disseminates professional knowledge about the FA's and ADA's progress, developments and best use in campaigns; cultivates a common understanding of the power, limitations and application of joint Fires, both lethal and nonlethal; fosters joint Fires interdependency among the armed services; and promotes the understanding of and interoperability between the FA's and ADA's active and RC units—all of which contribute to the good of the FA and ADA, Army, joint and combined forces, and our nation.

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100 years of *Fires*

***Fires Bulletin* – 100 years of service to the professional Fires Soldier**

“FOR MOST MEN THE MATTER OF LEARNING IS ONE OF PERSONAL PREFERENCE. BUT FOR ARMY OFFICERS, THE OBLIGATION TO LEARN, TO GROW IN THEIR PROFESSION, IS CLEARLY A PUBLIC DUTY.”

GEN OMAR BRADLEY

Learn from the past, keep an eye on the present, and prepare for the future. This special commemorative edition marks the 100th anniversary of the *Fires Bulletin* magazine. The first edition January-March 1911, known as the *Field Artillery Journal*, started a proud tradition of providing leaders and Soldiers with up to date information on doctrine, tactics, techniques, and procedures.

Several of the articles in this issue touch on challenges of the past, changes that brought us to the present and conditions they set for the future. Many of the themes we talk about today are highlighted in the historical articles of our branches and validates Bradley's quote as we address similar issues today – “Happy 100th Birthday – *Fires Bulletin*.” Therefore, we must be well grounded in the basics of our warfighting function of Fires- our Army and our country depend on it.

The journal was born to meet the need of an U.S. Army Field Artillery branch that was setting the conditions for a professional training and education system and as a way to keep its members up to date on the current professional tactics, techniques and procedures. CPT William J. Snow (who later became MG Snow) came up with the concept for the magazine and was also the first editor. Although resources were scarce, he worked tirelessly to get the magazine going in its formative years and it has developed into the professional bulletin we have today.

Throughout the years the *Fires Bulletin* has gone through several name changes, reflecting Department of the Army policies, the reoccurring splitting and merging of branches and various other changes that required a title change. Today, just as in 1911, the bulletin serves as a professional outlet for the Fires forces to address



By MG David D. Halverson
**Commanding General of the U.S. Army Fires Center of Excellence
and Fort Sill, Okla.**

challenges and issues we all face. Two articles in particular, provide the context for the last 100 years. As with a democracy, the maturity of the Fires Center of Excellence will take time, but focus, the basics and our character will posture us well.

The first is a historical article by Dr. Boyd L. Dastrup, the field artillery historian for the U.S. Army Field Artillery School. His article, “History of the U.S. Army Field Artillery School from birth to the eve of World War II,” is part one of a two-part series that chronicles the many milestones and achievements Fort Sill and the FA branch have achieved since its inception a century ago. Many challenges we face within the Army, our all-volunteer human capital, how to shape the force for the future fight, and creating a professional organization in a resource-constrained environment, are not new challenges, but are ones the Fires

Force must deal with now and in the future. We must take an enterprise approach.

The School of Fires, like the *Fires Bulletin*, overcame many challenges

as well. CPT Dan T. Moore, the first Commandant of the School of Fires, visited several different European Artillery Schools before establishing the School of Fires at Fort Sill in September 1911. He used the German School as the model which had combat development, testing capability and training under one roof – much like the Fires Center of Excellence we have today. Another forward thinking officer, LTC Butner's quote from 1923 could fit into our current Joint and Combined Fires University Implementation Plan... “The subject of Field Artillery is a life study and the school hopes to lay the foundation on sound principles for such study. The artillery officer must continue the study of his profession, or he will fail when the time comes to practice it. And failure in war means failure in life, for the Soldier.” (Dastrup, 2010). LTC

Butner's thoughts focus on life-long learning and the importance of a "foundation" or the "basics" of the profession.

The second article which helps draw on the past is written by Mr. David A. Christensen on the history of the U.S. Army Air Defense Artillery. In it he talks about the birth of the ADA to meet a new threat and how force design and weapons systems put the U.S. ADA at the top of the coalition pile when it came to employment of Fires - a feat achieved in very short order through a focus on basics and a strong training program that developed effective battle drills and gunnery skills important to a professional branch. The latest training techniques and tactics were studied from across Europe to produce a U.S. shoot to kill ratio of "600 rounds per enemy aircraft" versus the closest coalition partner rate of "6,000 to 1."

Innovative leaders understood the new "technology" (aircraft) and how it was changing their operating environment. They developed the skills and training needed for LT A.T. Slaten and his crew to shoot down the first enemy aircraft for an American ADA crew in May 1918. Those techniques spread across the force and made the U.S. ADA crews the most effective of the war.

Additional articles in this issue share common threads with the ones from 1911 such as caring for your equipment, scouting techniques and joint force development. Several articles from the 1911 issue are printed this month to highlight some of the discussions and focus of that period in our history.

Today, the *Fires Bulletin* highlights the best lessons learned and forward thinking of both the FA and ADA branches. It maintains the tradition started 100 years ago of a professional journal dedicated to the Soldiers and leaders of the Fires force.

Although the continuation of publishing of the bulletin has been tenuous over the years, two key themes have endured for the past 100 years and continue to resonate during present day: the continual emphasis on combined arms doctrine and the continual effort to include joint, intergovernmental, interagency and military (joint and combined) components in the overall Fires campaign strategy and concepts.

Today, the synergies between the two branches continue to grow, especially in our capabilities department. Constant professional dialogue between the branches is imperative, and submitting articles to the *Fires Bulletin* is just one way to achieve this objective. As we move deeper in to the Fires force of the future and continue to learn from our past, we face unprecedented opportunities that as a Fires force we are just beginning to realize. We have a wealth of talent and innovation among our force. So as Fires professionals let's not only take time to celebrate how far we've come, but continue to engage and collaborate providing input to the Fires Center of Excellence in order to make the next 100 years just as productive as the first.

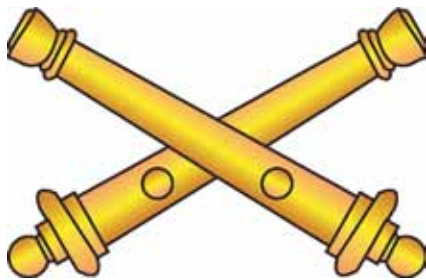
Fit to Fight – Fires Strong.

Artillerymen fire during a gas mask attack in the Argonne Forest Area, Wis., during World War I. (Photo from Fires Bulletin historical archive.)



The SITREP

One hundred years ago, the Field Artillery Journal published its first article. Below are updates on where the U.S. Field Artillery Association and Air Defense Artillery Association stand today.



US Field Artillery Association

Major accomplishments:

100th anniversary celebration, May 2010

Donation of the Field Artilleryman Statue in front of the Field Artillery Museum, Fort Sill, Okla.

Addition of five new scholarships

Benefits of membership:

Subscription to *Field Artillery Journal*, fellowship with professional field artillerymen, eligibility to win scholarships for members and members' immediate family, invitation to U.S. Field Artillery Association functions and events

Dues:

One year: \$25, two years: \$40, three years: \$60, five years: \$100 and lifetime: based on age

How to join:

Visit the association's office at 758 McNair Avenue, Fort Sill, Okla., or the association's website at <http://www.redlegoutpost.com>



Air Defense Artillery Association

Major activities:

General membership meeting, Oct. 6, 2010

Board member advisors engaging and educating students in the ADA schoolhouse

Establish contract to emplace first brick campaign orders at the base of the Air Defenders Statue

Benefits of membership:

Receive updates on current Air Defense Artillery Association initiatives, receive the *ADAA Journal* (to be launched tentatively in April 2011), discounts on ADAA merchandise, contribute to helping ADA causes

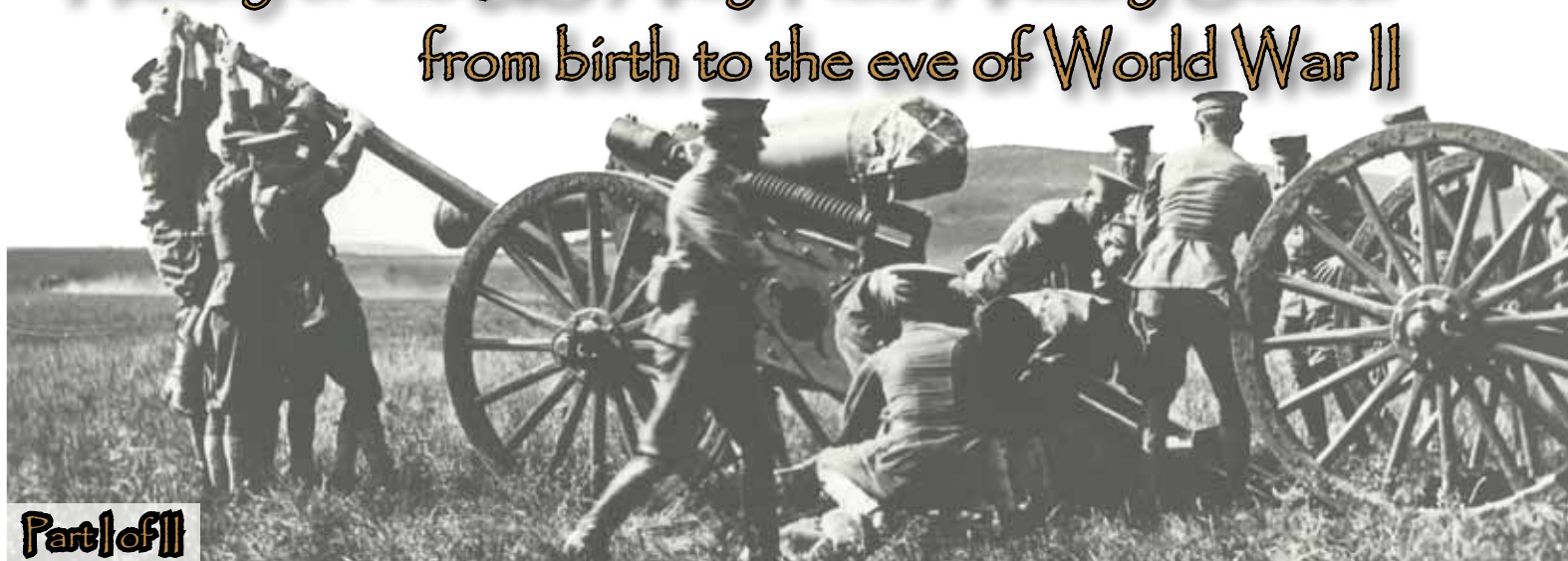
Dues:

Annual membership: \$25 or lifetime membership: \$200

How to join:

Visit the association's website at <http://www.firsttofire.com/>

History of the US Army Field Artillery School from birth to the eve of World War II



Part of II

Soldiers with E Battery at practice with the seven inch siege guns at Fort Sill, Okla., c1910-20 (Photo courtesy of the Fort Sill Museum, Fort Sill, Okla.)

By Dr. Boyd L. Dastrup

The 20th century ushered the U.S. Army into a new world. During the latter part of 1800s, the Army fought Native Americans in the Trans-Mississippi West and was scattered in small forts to accomplish its mission. A good example, Fort Sill, Okla., in Indian Territory served as a cavalry post and as a base of operations during the Red River War of 1874-1875 against hostile Comanche, Cheyenne, and Kiowa bands and even guarded Geronimo as a prisoner of war. International events, however, prodded the Army to reexamine its priorities. The Spanish-American War of 1898 propelled the U.S. into the international arena, causing it to emerge as a world power. This and the vital need to modernize, in view of an European arms race, encouraged the Army to convert from a frontier constabulary, designed for policing the Trans-Mississippi West, to a force capable of fighting an European-styled army. This transformation, in the beginning of the 20th century, led to the opening of the School of Fire for Field Artillery in 1911 to train field artillerymen.

Birth, struggle, and validation. Secretary of War, Elihu Root, who was appointed in 1899 by President William McKinley, restructured the Army over several years. Under his direction, the War Department fashioned a progressive and sequential education system in 1901, consisting of the U.S. Military Academy; garrison schools at each post for elementary instruction in theory and practice; service

schools (the Artillery School, the Engineer School of Application, the School of Antisubmarine Defense, the School of Application for Cavalry and Field Artillery and the Army Medical School); the General Staff and Service College; and the Army War College for professional training. Root also noted the lack of long-range planning capabilities, in the War Department, and urged Congress to create a general staff to prepare military plans. Despite stiff opposition in Congress and the War Department, Congress adopted Root's recommendations in 1903, establishing a chief of staff and a general staff.

Root also pushed Congress to enlarge the Army, to meet the country's newly acquired overseas needs. In February 1901, a congressional act expanded the infantry from 25 to 30 regiments, dissolved the artillery's regimental organization, which mixed coast and field artillery units in the same regiment, and established the corps of artillery, composed of coast artillery and field artillery units.

Six years later, Congress finally acknowledged the need for two separate artillery branches. On Jan. 25, 1907, Congress divided the coast artillery and the field artillery into independent branches and created permanent field artillery regiments and battalions during peacetime, allowing the War Department to develop officers, noncommissioned officers, and enlisted personnel with field artillery expertise.

The separation of the coast artillery and field artillery, the adoption of sophisticated field guns, the emergence of indirect fire, and the lack of field artillery training prompted

action. In 1908, the Chief of Coast Artillery, MG Arthur Murray, recommended opening a school of fire for field artillery. About the same time, President Theodore Roosevelt and a group of progressive field artillery officers also pushed for formal training to make the branch more professional.

To this end, Roosevelt directed the War Department to send CPT Dan T. Moore of the 6th Field Artillery Regiment, a man educated abroad and a former aide to the president, to Europe in 1908 to observe European field artillery training. While he was there, he visited field artillery schools in Austria, Hungary, Holland, England, and Italy and studied at the German Army's Artillery School at Juterborg. Because it developed and improved methods of fire, tested new material, and emphasized firing and tactical exercises, among other things, the German school especially impressed Moore.

At the direction of the War Department, Moore subsequently traveled to Fort Sill in November 1910, to make arrangements for a field artillery school there, using the Juterborg school as a model. Fort Sill's wide expanse of land, 51,000 acres of varied terrain providing sufficient room for target practice and maneuvering of field artillery batteries; a mild climate permitting training all year; and the presence of the 1st Field Artillery Regiment, caused Moore to endorse the Oklahoma post as a home for field artillery training.

Also favorably inclined to the location, the War Department eventually approved Fort Sill as the home for the new school. War Department General Orders, No. 72,

June 3, 1911, authorized the School of Fire for Field Artillery at Fort Sill, outlined its priorities of providing practical instruction and designated the courses of instruction. A couple of days later, War Department General Orders, No. 73, made the school an official part of the War Department's professional educational system that included the U.S. Military Academy, post schools for enlisted personnel, garrison schools for officers, and branch service schools for branch and technical training. Shortly after, on July 19, 1911, the War Department selected Moore as the commandant.

Several months later, the School of Fire for Field Artillery opened its doors on Sept. 15, 1911, to mark the beginning of standardized gunnery instruction and training and some instruction in field artillery tactics and brought an end to Fort Sill's days as a cavalry post. Operations began with a small staff and faculty, CPT Dan T. Moore, 1LT Ralph M. Pennell, 1LT Roger S. Parrott, and 1LT John C. Maul. Of the four, only Moore had experience as a field artillery officer. Parrott had recently transferred from field artillery to ordnance, giving him minimal field artillery expertise. Pennell was a cavalry officer and Maul was an infantry officer. Moore wrote, "they set out to teach officers by actual practical exercise . . . the general principals in conducting fire . . . [and] the tactical employment of field artillery, with a clear emphasis on gunnery."

During the school's first years, Moore focused on the basics. Students spent time with flash targets, prepared firing data and learned to adjust fire onto a target. They also learned panoramic sketching, technical and tactical battery drill, and practical ballistics. Among other things, they also fired field guns, and for many this was a new experience. Some students could even hit a target and compute gunnery solutions

within the allotted fifteen seconds.

Moore's successor, LTC Edward P. McGlachlin, continued improving the school. He published supplementary training literature and gave additional training time to tactics. This created a more comprehensive instruction program and produced a more broadly trained graduate.

With Moore and McGlachlin as commandants, the School of Fire made concrete progress since opening in 1911. In a memorandum for the Chief of Staff of the Army, MG Hugh L. Scott, about the school, the Chief of the War College Division, BG M.M. Macomb, on Dec., 18, 1914, stated, "graduates could shoot and hit targets better than their predecessors of 1911-1913." The memorandum credited the improved firing of FA batteries to the school and its graduates who returned to their regiments and taught their colleagues.

War years. The Mexican Revolution soon influenced the infant school. In August 1915, the War Department shipped two of the school's field batteries to the border, causing McGlachlin to close the school in the fall of 1915, permitting students to return to their units. Although the school reopened in February 1916, reoccurring Mexican border troubles forced closure, once again. On May 9, 1916, the War Department shutdown the School of Fire and the School of Musketry, which had been at Fort Sill since 1913 and had competed with the School of Fire for limited resources, and sent all officers to the border. The last field artillery officer left July 9, 1916; and the School of Fire did not open again until July 1917, during World War I.

World War I invigorated the School of Fire for Field Artillery. In early July 1917, the school consisted of a caretaker detachment under COL Robert M. Blatchford, an infantry officer and the commander of Fort Sill. On July 10, 1917, a brief telegram from the War Department, notified Blatchford of plans to reopen the school, satisfying wartime requirements. Five days later, SGT Morris Swett, the school librarian, met 21 students as they stepped off a train from Oklahoma City, Okla., for training.

Subsequently, the instructors, handpicked by the incoming Commandant of the School of Fire for Field Artillery, COL William J. Snow, who had also participated in founding the Field Artillery Association and the "Field Artillery Journal" in 1910 as a captain to promote professionalism, and school staff, slowly began to show up. On July 19, 1917, Lieutenant Colonels F.E. Hopkins, and Fred T. Austin, Captains Robert M. Danford and Cliff Andrus, as well as other active Army field artillery officers, reported for duty to

serve as instructors. Afterwards, on Aug. 3, 1917, a small contingent of French field artillery officers, with combat experience on the western front, arrived to teach French doctrine and tactics.

Meanwhile, on July 27, 1917, Snow, from the 4th Field Artillery Regiment, reported for duty and replaced COL (later Brigadier General) Adrian S. Fleming. Snow found Fleming, struggling to organize a school, with little or no resources. In fact, the small cadre of instructors lectured out of the Field Artillery Drill and Service Regulations of 1916, to the diverse class of 21 students who had arrived earlier in July. They formed class zero, distinguishing it from the regular wartime classes that began in October 1917. Some officers of class zero were active U.S. Army Cavalry and Coast Artillery officers, who had been transferred to the field artillery, filling shortages. Some were National Guard officers; and some were former noncommissioned officers who had recently been commissioned.

Despite and competition for firing ranges and other resources with the 36th Division, composed of Oklahoma and Texas National Guard units, the 35th Division, comprised of Kansas and Missouri National Guard units and CPT Harry S. Truman's 129th Field Artillery Regiment, and the School of Musketry, which had reopened and later left for Camp Benning, Ga., in the fall of 1918 to make room for field artillery training, and the inexperience of zero class, Snow achieved remarkable success. Students in zero class graduated and left for France. To support school's training, the War Department built a school complex, for classes, as well as barracks on the plateau northwest of the old post, using Snow's facility plan. Named Snow Hall, after Snow, who later became the first chief of field artillery on February 15, 1918, the central school building included the office of the administrator, large class rooms, a movie theater, small class rooms, and other rooms.

In the midst of the construction, the first wartime class assembled on Oct. 1, 1917, for 12 weeks of training. The class, composed of active Army, National Guard, and National Army officers, ranging from second lieutenant to colonel, received its introduction to the school in the Old Trader's Store, also serving as the administration building and school library until the school complex was completed. As Fleming, who had replaced Snow in September 1917 when he left to command a field artillery brigade, explained to the students, the school's main mission focused on gunnery instruction, although it also trained aerial observers, in a two-week course at Henry Post Field on



French liaison officers at the School of Fire in 1917. (FROM LEFT TO RIGHT) Lieutenant L.A. Girard, Captain C.P.F. Pierret, Major E. Durette, Lieutenants H. Negre and J. Varrall. (Photo courtesy of U.S. Army Field Artillery School)

Fort Sill. Upon graduation from the school's observer course, some students entered the School for Aerial Observers at Henry Post Field, later reorganized as the Air Service School in August 1918, for additional aerial observer training.

During the last training week, the school's culminating training event gave the students the opportunity to conduct unobserved indirect fire, using maps, and observed indirect fire from trenches modeled after those in France, for realism. Employing this trench system, other practical exercises and class room instruction, the school trained 3,000 officers in open warfare and trench warfare during the war and formed the heart of an extensive field artillery training program, composed of replacement schools, for training officers and enlisted personnel, brigade firing centers, such as the one at Camp Doniphan on Fort Sill where field artillery brigades were mobilized and trained, and an officer training school, for officer candidate training.

As Snow observed, the School of Fire for Field Artillery started from scratch and had a rebirth in July 1917. Closing the school, during the crisis on the Mexican border, in 1916 and 1917, ended a brief but successful era and created a void. The School of Fire for Field Artillery, under Snow and Fleming, competed for limited resources with the National Guard divisions, the brigade firing center, and the School of Musketry, innovated by developing an aerial observer course and constructing a World War I trench system. The school rose to the occasion after reopening, becoming a training focal point, for officers with duty in France.

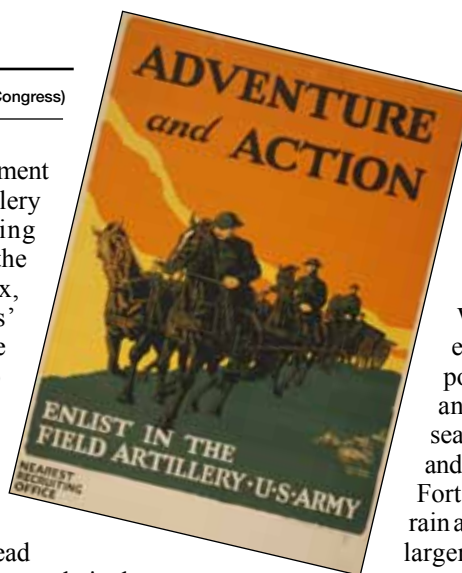
Atenuous existence. While World War I validated the School of Fire for Field Artillery's reason for being, peacetime brought uncertainty. As part of the National Defense Act of 1920, guiding military activities during peacetime, Congress revamped the War Department's education system, outlining an extensive sequential and progressive training and education system, for the U.S. Army active and Reserve forces with the Field Artillery School being a key element. In early 1922, the War Department, however, concluded its existing officer education system was too cumbersome and expensive, in an era of declining military budgets, and formed a board to streamline training and save money. Headed by McGlachlin, now a brigadier general, the board scrutinized the school system.

At the time, the War Department had a decentralized field artillery training system, conducting field artillery training in the Basic Course, Camp Knox, Ky., the Battery Officers' Course, Fort Sill, and the Field Officers' Course, Camp Bragg, N.C. This prompted the McGlachlin board to propose consolidating the three field artillery schools at one location, with Camp Bragg and Fort Sill being the lead contenders. Because Fort Sill was relatively small, the board viewed locating the school there as a temporary solution, until money was available to move it to a better site. Backed by this recommendation and the availability of firing ranges and other resources at Fort Sill, the War Department selected the Oklahoma installation as a short-term expedient and consolidated all field artillery courses there in 1922, to reduce expenses.

Addressing the importance of the officer courses, Assistant Commandant of the Field Artillery School, COL Henry W. Butner, commented in "The Shrapnel," the school's yearbook, in 1923, about the school's crucial role in professional education. According to Butner, graduation from the Field Artillery School marked the beginning of a career.

He wrote, "The subject of field artillery is a life study and the school hopes to lay the foundation on sound principles for such study. The artillery officer must continue the study of his profession, or he will fail when the time comes to practice it. And failure in war means failure in life, for the Soldier." Butner reinforced professional life-long learning, beyond the school so officers would be successful in war when it came.

A key strength of the school's instruction program involved practical exercises, which reinforced classroom instruction. During the 1920s and 1930s, such inventive training gave U.S. Army, National Guard, Reserve, and Marine Corps officers attending the school full-time, opportunities to apply theoretical knowledge to field conditions. They participated in map problems, practiced night adjustment of fire, and conducted live fire, among other practical exercises. Meanwhile, enlisted Soldiers acquired skills in shorthand, motor mechanics, horse shoeing, saddlery, communications and cooking in resident courses.



Meanwhile, the school's future at Fort Sill remained unclear. To end the uncertainty, the War Department explored other potential locations and narrowed its search to Fort Sill and Fort Bragg, N.C. Fort Bragg had more rain and snow and was larger, with 120,454 acres, than Fort Sill. In contrast, Fort Sill had

more housing, varied terrain and an elaborate firing range; but the installation was small, only 51,292 acres, but with a warmer, drier, windier and sunnier climate, permitting outdoor instruction almost every day. Influenced by this and the requirement to build a field artillery firing range, barracks and other facilities at Fort Bragg, Secretary of War, Patrick J. Hurley, who was born in Indian Territory, ended years of indecision about the Field Artillery School's permanent location. On Dec. 10, 1930, Hurley designated Fort Sill as the school's permanent home.

Hurley's decision formed a critical milestone in the evolution of the school, removing any doubt about the school's future, at Fort Sill and reinforced the invaluable training being conducted there.

More missions. In the midst of the struggle over its location, the school assumed an active role in combat developments. In cooperation with the field artillery board that moved from Fort Bragg to Fort Sill, in 1922, the school evaluated developmental motor-drawn (towed) howitzers and guns, self-propelled howitzers and guns, signal equipment, sights and other field artillery equipment, in the 1920s. In 1928 and 1929, the school tested porté field artillery, where light field pieces were loaded onto trucks or trailers for rapid transportation, but failed to reach any firm conclusions about its suitability, not making any recommendations. Later in 1933 and 1934, the school tested an experimental battalion of truck-drawn field artillery. Completed in 1935, the school's study demonstrated the maneuverability of truck-drawn field artillery, finding it less vulnerable and less subject to fatigue than horse-drawn units, and urged adopting motor vehicles as prime movers, but only after they had become more reliable.

Although it participated in other combat development projects, the school's most innovative work came with the creation of the fire direction center in the 1930s. During the 1920s, massing fires with observed indirect fire proved to be difficult. Observed fire relied on a forward observer, locating targets by providing a descriptive reference to a prominent terrain feature on a map, or by giving the target's coordinates to the batteries for plotting. As long as maps were available, the battalion could mass observed indirect fire. Without maps, the battalion had to adjust its firing batteries individually onto the target, and this was time consuming.

Motivated by the need to mass fires more rapidly on a battlefield that was growing more mobile, the Director of the Gunnery Department, MAJ Carlos Brewer, set out in 1929-1933 to make fires more responsive. Brewer and his instructors abandoned massing fire by a descriptive terrain feature or grid coordinate reference. They introduced a firing chart, adopted the practice of locating battery positions by survey, and designated targets with reference to the base point on the chart. In the spring of 1931, the Gunnery Department successfully demonstrated massing battalion fire using this method. Yet, Brewer did not centralize computing firing data, at the battalion, even though he and other field artillery officers advocated this practice. He kept this function in the battery, because he could not, at the battalion, find a reliable method of computing firing data.

Brewer's successor, MAJ Orlando Ward, eventually solved the problem of centralizing computing firing data. From 1932 to 1934, Ward and his instructors developed the fire direction center. The battalion commander became the director of fire whenever fire control could be centralized; and the battery commander became the conductor of fire. With accurate maps, the battalion fire direction center could mass fire within ten minutes of receiving a call for fire; a battery could provide fire within five minutes. Without maps, the fire direction

center generally took longer to mass fires.

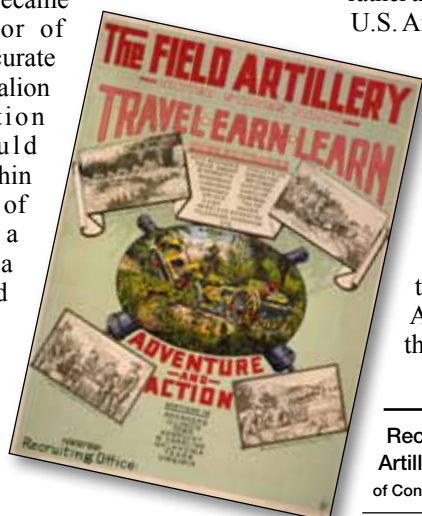
Although the fire direction center promised to make fire support more responsive, the field artillery and the War Department resisted adopting it. Refinements to the center in 1939 by the Director of the Gunnery Department, LTC H.L.C. Jones, and his staff and instructors paved the way for acceptance. He displayed his improvements, in early 1941, to the Commandant of the Field Artillery School, BG George R. Allin, convincing him to accept the center. After the Chief of Staff, GEN George C. Marshall, witnessed a four-battalion shoot at Fort Sill on April 10, 1941, the War Department adopted the fire direction center. Subsequently, a demonstration of the fire direction center in October 1941 finally converted the Chief of Field Artillery, MG Robert M. Danford, to the concept. Coupled with the graphic firing table introduced in 1940 and the portable radio, the school's fire direction center revolutionized fire support. As a team, they permitted shifting observed fires, rapidly and effectively around the battlefield.

Reinforcing its leadership, in fire support doctrine and organization, the school meanwhile worked on organic aerial observation. To make aerial observation more effective, the Field Artillery School and the field artillery advocated adopting organic field artillery aerial observation after World War I but gained few adherents. Although organic field artillery aerial observation received little attention during the 1920s, Danford revived interest in it in the late 1930s because longer range field guns being introduced and the growing use of camouflage and deeply defiladed batteries made ground observation problematic. He wanted the U.S. Army Air Corps to supply the field artillery with light aircraft, pilots and ground crews and proposed aircraft be assigned directly to field artillery units, rather than corps headquarters, as outlined by U.S. Army doctrine. Organic field artillery aerial observation would furnish responsive aerial observation and facilitate engaging deep targets.

Undeterred by opposition from airpower enthusiasts and U.S. Army doctrine and supported by MAJ William Ford's article on organic aerial observation in the "Field Artillery Journal" in April 1941 and various studies by the Field Artillery School, Danford

formally petitioned the War Department on Oct. 8, 1941, for organic field artillery aerial observation. Although he initially encountered stiff resistance, from the Chief of the U.S. Army Air Corps, MG Henry H. Arnold, the airpower enthusiast relented and agreed to support any experimenting. With this endorsement, Danford subsequently obtained approval from the War Department on Dec. 10, 1941, to test organic field artillery aerial observation in February and March 1942. Using various light aircraft models, the experiments demonstrated the timeliness and reliability of organic field artillery aerial observation. This prompted the War Department to issue a directive, on June 6, 1942, establishing organic field artillery aerial observation and creating the Department of Air Training in the Field Artillery School to train students to land small aircraft on roads, short-improvised landing strips and open fields, as well as observing fire from the air, among other critical skills.

As participation in the development of organic field artillery aerial observation suggested, the Field Artillery School became a noteworthy institution. While classroom instruction and innovative practical exercises trained field artillerymen in their trade, the school's stress on life-long professional development and pioneering efforts in combat developments led to the fire direction center, organic field artillery aerial observation, and Army aviation and paved the way for the powerful field artillery arm of World War II.



Recruiting poster for the U.S. Army Field Artillery, circa 1920. (Photo courtesy of Library of Congress)

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Soldiers train on the Lewis machine gun at Camp Mills, N.Y. (Photo courtesy of Library of Congress)

Air Defense Artillery contributions, solutions and issues during World War I

By David A. Christensen

As the U.S. entered World War I, it became apparent a new technology had been introduced into combat, and this new technology was quickly becoming a force multiplier. The new threat was the Aero-Plane. The Aero-Plane was soon adapted by war planners to serve in a variety of missions, ranging from aerial observation, to long-range bombing missions deep behind enemy lines.

By 1915, the Germans had developed bombers that terrorized Paris, and by 1917, these German Gothas, which were heavier-than-air strategic bombers, were crossing the English Channel successfully bombing London. To counter this new threat, the war department reached out to the U.S. Army Coastal Artillery and elected Brigadier General James B. Shipton to be the first chief

of the Anti-Aircraft Service. GEN Shipton would soon depart for France where he stood up the first American Air Artillery School, Sept. 26, 1917, while in theater with the American Expeditionary Force.

The original class of 1917. The first course consisted of 25, U.S. Army Coastal Artillery officers, who received their anti-aircraft instruction from French officers. After completing their training, these first officers served as cadre for the artillery section of the American AA School. Two more sections of instruction were soon added to the AA school, a machine gun section and the searchlight section. Shipton augmented these two courses of instruction by outsourcing other branches within the American Expeditionary Force; the machine-gun training was provided by infantry officers, and the searchlight instruction was taught by engineer officers. In all, the American Anti-Aircraft School produced 659 officers and 12,000 enlisted Soldiers by war's end.

Doctrine and tactics. The Anti-Aircraft Service had a maxim that "firing should not be adjusted, but prepared." The reason this maxim was adopted, was because of the inaccuracy of the 75mm cannon as the high-altitude anti-aircraft deterrent, and the tactics of employing such a weapon. Aiming adjustments during an engagement with the 75mm, became an impossible task. Instead, gun crews would pre-register their guns. This pre-registration consisted of firing a volley of rounds into the air, to determine where the desired air burst would occur. With multiple gun systems concentrating on the same avenue of approach, "volume of fires" soon became the solution to the aerial problem. This solution was also a result of how the aircraft was typically employed. Aircraft pilots used terrain features to navigate, and they preferred linear routes. These observations of aircraft techniques allowed AA units to develop plans that employed their guns along these predicted routes. "Diversity of fires" along these routes was also important.

Machine guns were used against low-altitude targets, while air bursts delivered from the 75mm engaged the high-altitude threat.

The Anti-Aircraft Service also developed a doctrine of “deterrent fires.” It had become widespread knowledge that “although hitting a plane was common, bringing one down was regarded as a fortunate incident.” From this lesson learned, American AA students were instructed on techniques to deter the aircraft and keep it at a distance. Instructors drilled into the students that forcing an aircraft to fly at a higher altitude would decrease their accuracy, as was the belief that a successful volume of fire would discourage the pilot from reaching his objective.

The American Anti-Aircraft Service was the principal user of searchlights during World War I. In all, the AA Service had 34 platoons activated while in theater. Most Europeans believed that searchlights were impractical and would give frontline positions away to enemy targeting. The Americans, however, adopted the searchlights primarily for rear defenses. The searchlight quickly made an impact as a deterrent to nighttime bombing raids. Their success was achieved, in part, by the ability to track and highlight a threat. However, the nighttime tracking of an aircraft by a searchlight often hindered a pilot’s ability to see and would cause him to become disorient and ineffective, often abandoning his target.

The first recorded kill. The highlight for the newly formed service came to fruition on the 18th of May 1918. A German observation plane was crossing between the security of the Germany’s lines, and into the buffer of no man’s land, trying to collect information on unit positioning. An alert crew of the 2nd Anti-aircraft Battery was located approximately 2,700 meters away and was armed with two French 75mm guns. As the crew prepared the shell fuses for the desired altitude, LT A.T. Slaten calculated the necessary data, on range, location, and speed. Soon the air was filled with the burst of powder and fragmentation, and the effects provided

results. The German observation plane went into a dive, followed by an uncontrolled spiral, finally crashing into the 500 meters of ground known as no-man’s land. The crew managed to survive the crash, and was viewed scrambling from the wreckage and behind German lines. That night, a French infantry patrol ventured across friendly lines to strip the enemy plane of its machine guns, and other useful equipment. The patrol was also successful in cutting away a piece of the aircraft underbelly and later presented it to the American Battery Commander, CPT E. A. Mellon as a souvenir and confirmation of the American’s first recorded kill.

By the war’s end, America’s Anti-Aircraft Service was the most successful among the allies. The success was attributed to the tenants of good training, the doctrine they developed and used, and to the skill and discipline of the crews operating the weapon systems. When comparing the data, it took a British gun crew 10,000 rounds and the French crew 6,000 rounds to down a single plane. But, it took only 600 rounds for the Americans to bring one down.

First to Fire!

David A. Christensen currently serves as the U.S. Army Air Defense historian for the U.S. Army Air Defense Artillery School at Fort Sill, Okla. He spent 22 years of active service with the U. S. Army in various assignments as both an NCO and commissioned officer. He served with the Training and Doctrine Command as a professor of military history at the Army’s Command and General Staff College for the past several years, before arriving to Fort Sill in 2009 as the Air Defense Branch Historian. He is also resourced by Cameron University as an adjunct professor. He received graduate degrees from The University of Oklahoma, 1993, Kansas State University, 2003, and is a graduate of the Army’s Command and General Staff College resident course, 2001.

Anti-aircraft searchlights illuminate the night sky above Washington Barracks, District of Columbia. (Photo courtesy of the Library of Congress)





An Afghan National Army soldier sits at the end of an M119 light-tow howitzer from B Battery, 4th Battalion, 25th Field Artillery Regiment at Forward Operation Base Airborne, Afghanistan, Oct. 14, 2009. Afghan soldiers were culminating their field artillery certification after training for the past eight months with U.S. Army Soldiers from 4-25th Field Artillery. (Photo by SGT Teddy Wade, U.S. Army)

New artillery school will serve as the Fires foundation for the professionalism of the Afghan National Army

By LTC Charles D. Kirby, U.S. Army, and LTC Richard Vagg, Royal Australian Artillery

In March 2010 the Afghan National Army was at odds with itself. The ANA leadership had long since identified a requirement for a long-range indirect fire capability. They decided to fill this requirement with the D-30, a Soviet designed 122 mm howitzer, with a max range of 22 kilometers donated to Afghanistan a few years prior. However, by March 2010, the only capability the D-30 had brought to the ANA was a huge, inaccurate, direct-fire weapon system. The only manual that had been developed for

the operators was a poor translation of an old Russian maintenance manual. Programs of instruction were developed for a 6-week, direct-fire course to be conducted as a part of their advanced combat training which was similar to the U.S. Army's advanced individual training. But, the ANA training did not include fire support or fire direction and there no supporting doctrine on how to nest ANA Field Artillery into the maneuver commander's order of battle.

On top of that, much of the basic issue items and sighting equipment for the fielded ANA D-30 batteries had long since been lost or damaged. Worse yet, maneuver commanders who had the *King of Battle* at their disposal reassigned their Redlegs to guard duty and KP-like duties because they had no understanding of how to

employ them.

In March 2010, LTC Rich Vagg, Royal Australian Artillery, received orders to report to Afghanistan to serve as commander of the Artillery Training Team-Kabul. Additionally, he was assigned to serve as the senior advisor to the ANA director of the field artillery and the commander of the ANA School of Artillery.

Vagg, who is a seasoned Australian field artillery officer, was excited about his new job as an 'advisor.' He reported to Kabul in mid-April and his team of nine, additional Australian Red legs would follow. Upon arrival in Kabul, he had an office call with the Combined Training Advisory Group-Afghanistan commander to receive his orders, which mainly consisted of standing up the ANA School of Artillery.

This is not what he had prepared himself for mentally. While artillery was being taught in Afghanistan, there was no proponent, no true institutional base to refine tactics, techniques, and procedures, no doctrine, and most of all – no indirect fire capability.

He was given this as his only definitive guidance: D-30 is the weapon system, and the first ANA Field Artillery battery needs to be prepared to join it's assigned combat support kandak (battalion) for collective training at the Consolidated Fielding Center located at Camp Blackhorse, Afghanistan in time to graduate by April 2011.

Vagg now refers to this as his “dream job,” because where else in one’s military career do you receive orders for such a huge undertaking and yet get so little guidance?

The Australian Redleg had his mission and immediately moved to the Australian version of the U.S. Army military decision making process, the MAP or military appreciation process. He determined a way ahead and wrote the order that would be used as a guide to develop the ANA School of Artillery and the doctrine to insert the artillery into its operational force. When his team arrived, he gave out his orders—write doctrine, re-write POIs, write field manuals, determine battle drills, develop a 6400 mil indirect fire capability with a weapon system meant for 1600 mil zones of fire, figure

out how to determine reliable firing data, and don’t forget to include a professional education system. However, the constraints he laid out for his team included some special twists — the majority of the ANA Soldiers they were dealing with were illiterate, approximately 25 percent of the weapon systems and associated crews had already deployed, and all the instructors needed to be ANA soldiers.

At the time, a clear standout among the Australian *Redlegs* was LT Luke Haitas, a young officer assigned to develop the fire direction procedures. Initially, as any good artilleryman would do, Haitas developed an ANA version of ‘Charts and Darts’—which is still used to check safety prior to executing a Fires mission. From there, Haitas began working with a contractor to build a handheld fire-direction computer which was equipped with an internal Global Positioning System and tabular firing tables based on standard metrological data. The end result was simple, it could be operated like a palm pilot with a stylus, but most importantly the UDC D-30 Gunnery Computer calculated accurate, safe, firing data as quickly as a handheld calculator can add and subtract. Although the UDC D-30 Gunnery Computer was developed specifically for the ANA School of Artillery, it is quite likely that other nations could

adopt this gunnery computer.

The next step was to build the cadre, for a two-pronged approach that included educating all current and future ANA Field Artillerymen, standardizing institutional cadre for a training base, and creating mobile education training teams for the previously fielded ANA Field Artillery units. The first ANA Train the Trainer Course, to build the institutional base with ANA instructors, graduated Sept. 26, 2010. These T3 graduates executed an end-of-course, live-fire exercise — ANA gunners, ANA FDC, and ANA fire supporters — all fired on time and on target.

The new METT teams are scheduled to be formed with a combination of coalition *Redlegs* all trained by the new cadre of the ANA School of Artillery. In May 2011, the METTs will complete training and begin moving to the ANA Field Artillery area of operations to field newly-refurbished D-30s complete with basic issue items. They will also re-educate the currently fielded artillerymen and their owning commands.

Each ANA Combat Support Kandak contains an ANA Field Artillery battery consisting of two, four-gun platoons. Given the asymmetric nature of warfare in Afghanistan, the employment of the currently fielded artillery batteries is ideal — within ANA forward operating bases.



An Afghan National Army soldier and Mongolian instructor teach newly enlisted Afghan soldiers about the 122 mm D-30 howitzer Oct. 4, 2010, at the ANA Kabul Military Training Center, outside of Kabul. These fresh recruits are part of the new artillery school at KMTC, where students learn the history of artillery and how to use artillery equipment. (Photo by SGT Rebecca Linder, U.S. Army)



Lt. Gen. Shir Mohammad Karimi, left, general staff chief of operations, Afghan National Army, thanks an Australian trainer, who is part of the Australian led Training Team – Kabul, Oct. 4, 2010, at the official opening ceremony of the ANA School of Artillery at Kabul Military Training Center, outside of Kabul. (Photo by SGT Rebecca Linder, U.S. Army)

Employed in this manner the ANA Field Artillery can provide optimal coverage and will nest well within the ANA order of battle. Further, it provides a great forum for the METT teams to simultaneously educate the various fire support elements and their maneuver leadership at the Kandak, brigade, and corps levels. The METT teams will play a crucial role in the proper integration of the artillery into the Afghan National Army. They will field completely refurbished weapon systems; but more importantly they will educate, inform, and advise the maneuver commanders at every level on how to utilize the King of Battle in the heat of battle.

The newly established ANA School of Artillery, began training the first class of *Redlegs*, Oct. 4. A cadre of ANA soldiers (39 in all) and advisors from four separate countries — Australia, Singapore, the United States, and Mongolia currently make up the teaching team at the ANA Field Artillery School. COL Shakerulah is the director of ANA Field Artillery, LTC Amin is the commander of the ANA School of Artillery, LTC Rich Vagg is the commander of ATT-K, and MAJ Piero Bertocchi is the executive officer for ATT-K. Hence the cadre and ATT-K is truly multinational and will become more so, once the METT teams begin to arrive, in 2011.

In the coming year, the ANA School of Artillery will produce more than 1,036 artillery soldiers — gunners, fire direction specialists, and fire supporters; 842

noncommissioned officer graduates; and 203 officer graduates. The METTs will execute the turn in of 93 previously-fielded D-30s and field 210 fully-refurbished and equipped D-30s across the ANA Corps. Additionally, the METTs will serve as the primary integrators and educators regarding all things artillery for the operational force throughout the ANA Corps. The future of the artillery within the ANA is definitely

moving in the right direction, and by the summer of 2012 the artillery will take its rightful place in the Afghan National Army as the *King of Battle*.

Lieutenant Colonel Charles “Skip” Kirby, U.S. Army Field Artillery, is currently the deputy director of operations, CJ3, NATO Training Mission Combined Security Transition Command - Afghanistan. Previously, he served as the chief of future operations, G3/5, for the Fires Center of Excellence, Fort Sill, Okla., until April 2010. He also deployed to Afghanistan from June 2006 to April 2007 in which he served as a Ministry of Defense mentor, Combined Security Transition Command-A Kabul and to Iraq in from July 2004 to February 2005 as a counterfire officer for III Corps, Field Artillery. In 1984, he earned a Bachelor of Arts in business from Sterling College, Kan.

Lieutenant Colonel Richard Anthony Vagg, Royal Australian Artillery, is currently serving as the commanding officer of the Afghan National Army Field Artillery Training Team, as a part of Operation SLIPPER (Australia’s contribution to Operation Enduring Freedom). Previously, Vagg has served a variety of regimental appointments within 4th Field Regiment, the 3rd Brigade and 6th Battalion (Motorized) of the Royal Australian Regiment, the 7th Brigade. On returning to Australia he will take up the position of the SO1 Joint Fires, Army Headquarters. In December 2011, he will assume command of the newly formed Air Land Regiment, Royal Australian Artillery.



An Afghan National Army soldier and Mongolian instructor teach newly enlisted Afghan soldiers about the 122 mm D-30 howitzer Oct. 4, 2010, at the ANA Kabul Military Training Center, outside of Kabul. These fresh recruits are part of the new artillery school at KMTC, where students learn the history of artillery and how to use artillery equipment. (Photo by SGT Rebecca Linder, U.S. Army)



Keeping it real: Don't let Joint Fires Observer skills deteriorate

By MSG Timothy Ryan

Congratulations, you have completed the Joint Fires Observer course at Fort Sill, Okla. Now what? I think the trend is to get back into the day-to-day grind of garrison operations with all the tasks that must be accomplished on a daily basis, but JFO skills may atrophy.

So, after three or four months back at garrison, are you ready to go to war as a JFO? If you are truly honest you might answer 'no' to the question. Because daily skills as a JFO might not be exercised, 'just-in-time' training might be needed to get back up to speed. This is the wrong approach and a better course of action is needed. A thorough continuation training program can help to ensure the maneuver commander is getting a valuable warrior.

The joint and combined integration directorate states in the article "Air, Land, and Sea Applications Bulletin," that ongoing training and qualification of JFOs are key factors in combat success. Luckily, the resources needed to build and sustain a robust JFO continuation training program exist at your garrison.

Continuous training. The integration of close air support into the ground scheme of maneuver is a perishable skill set that requires continuous training. Motivated leadership can build a comprehensive JFO program that can be tailored to any situation. Because of the joint nature of combat these days, it is imperative the services are able to work together in order to meet the supported commanders' intent. According to the JFO memorandum of agreement, the joint Fires observer training program relies on joint collaboration. As resources allow, Joint Terminal Attack Controllers and JFOs need to train together. A good way to accomplish is to visit the local tactical air control party personnel.

Only a select few wear the Black Beret that symbolizes the

U.S. Air Force 2nd Lt. Eamonn O'Shea looks off Snow Hall's rooftop as part of an exercise for the Joint Fires Observer Course at Fort Sill, Okla., April 15, 2010. (Photo by Marie Berberea, Fort Sill Cannoneer)

TACP. These Air Force specialists are assigned to Army combat maneuver units around the world. On a battlefield, they form a tactical air control party team that plans, requests and directs air strikes against enemy targets in close proximity to friendly forces. A TACP is generally a two-airman team, working in an Army ground unit and directing close air support firepower toward enemy targets on the ground.

Although the initial training begins at the JFO school house, JFO skills need to be honed at the home station. A great deal of training should be accomplished at the home station, and is the correct place for refresher and spin-up training. Maneuver training centers are vital to exercising all the pieces making up the joint fires team. However, they are not the venue for refresher or just-in-time training. Graduate level tasks should culminate at events such as National Training Center, Fort Irwin, Calif., and the Joint Readiness Training Center, Fort Polk, La. These training centers should be utilized for full-spectrum operations that provide JFO top-off training.

There are three parts to building a comprehensive continuation training program. The first part is gaining knowledge. Just because information was retained long enough to take a test at the JFO school house does not mean it will be remembered for the long haul. Along with academic learning comes the need to review new technologies that continue to change at an alarming rate. The second part of the equation is gaining practical skills that get the procedural requirements of close air support down to a second nature, and finally, putting it all together culminating exercise with the joint terminal attack controller/joint fire observer team and live-flying aircraft.

Academic training. The joint mission task list, as identified in the JFO MOA, outlines three mission areas a JFO should be able to conduct. Duty Area 3, in particular, addresses the air to ground aspect of joint Fires. As a JTAC, I am most concerned with this duty area. To accomplish Duty Area 3, the JFO needs a solid background in the academics of the close air support mission set. Though this information is taught at JFO school, continual refreshing of this information is needed. From my point of view there are three ways this can be accomplished. This includes taking online courses, reading and digging into applicable publications, and being familiar with the latest tactics, techniques, and procedures that go with the JFO skill set.

Many important references for JFOs are online or available through online courses. Distance learning is an easy way to gain knowledge while saving training costs. Online learning makes it possible to attend a course and never leave garrison. A good resource for distance learning is the Doctrine Networked Education and Training website located at www.dtic.mil/doctrine/docnet/.

DOCNET's mission is to promote understanding, training, and education in joint doctrine of the U.S. armed forces. This website also provides online access to many joint publications, like *JP 3-09.3 Joint Tactics Techniques and Procedures for Close Air Support*, and also allows users to take online exams. As an added benefit, the American Military University grants one college credit hour for successful completion of each DOCNET course. This isn't the only web source for information, The Joint and Combined Fires University located behind the AKO firewall on the Fires Knowledge Network also has a variety of courses that allows the user to delve into a variety of topics.

Additional training. JFOs should also study and review joint, U.S. Army, and U.S. Air Force publications which will help build a body of knowledge that is needed to be a thorough warrior. Besides the JTTP for close air support, JFOs will benefit from reading joint publications for joint fire support and joint airspace control in the combat zone. These particular publications cover topics such as the joint targeting cycle, airspace control and how to integrate unmanned aerial platforms in the operational environment. Also, a JFO should have a good understanding of the most recent Army publications that put "steel on target."

The Joint Electronic Library, located on the web at www.dtic.mil/doctrine/, provides access to several applicable publications, as well as the Curtis E. LeMay Center for Doctrine Development and Education, located at www.cadre.au.af.mil/main.htm. This

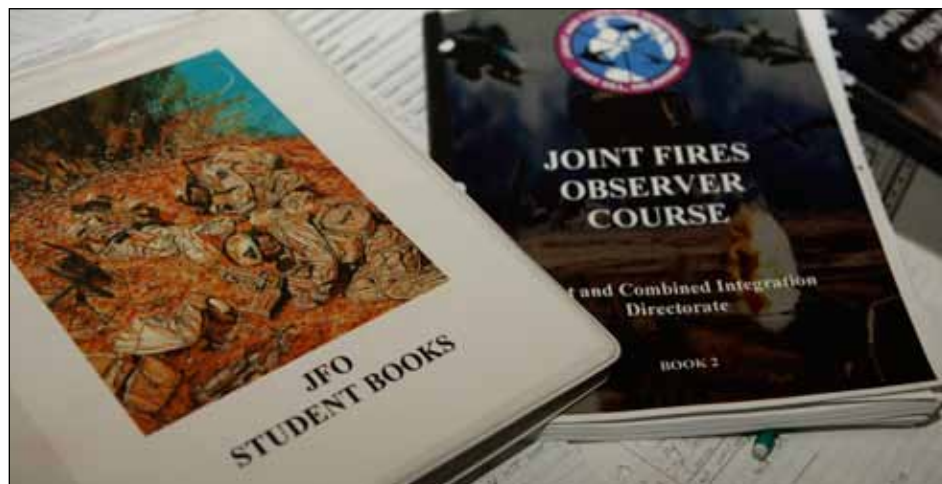
site offers an Air and Space Power Course which provides a broad understanding of airpower. Also by logging onto FKO, which can only be accessed with a CAC card, a user can click onto a link to Joint Knowledge Online. JKO is an online repository for training and informational material that impacts and improves the knowledge, skills and abilities of the joint warfighter.

Emerging doctrine. A final area to keep familiar with is emerging doctrine and the most current tactics, techniques and procedures. The 561st Joint Tactics Squadron, located at Nellis Air Force Base, Nev., both publishes and keeps track of emerging tactics. Though their files are U.S. Air Force centric, many of the procedures discussed will help with Duty Area 3 of the JFO MOA. These publications are comprised of the most effective methods identified for operations in support of Operation Iraqi Freedom and Operation Enduring Freedom. The squadron's focus is to ensure that the deploying warrior is current, relevant and extremely well prepared for combat, day one in theater. Though not available from the public domain, their website is accessible from a .mil domain located at <http://www.nellis.af.smil.mil/units/561jts/>.

Practical training. The practical skills of the CAS mission set are retained, refined and enhanced over time with practice. Every time there's participation in CAS training, personal skills sets will be enhanced and more confidence will be gained when the time comes to assist in the application of airpower. The following three training activities, tactical discussions, radio rehearsals and simulator controls, can provide the polish for necessary skills.

It's important to note, that some of the best tactical discussions I have taken part in have taken place after work. In my opinion, low key environments that minimize rank create the best atmosphere for the free exchange of ideas. In these discussions there are no bad ideas—just better ideas. These tactical discussions should be viewed as a "hot wash" or informal after action review. The difference is discussing what will happen as opposed to what did happen. Discussions should focus on devising new techniques to test the next time there is participation in a CAS training event. The best environment to test and refine new TTPs is during local training. Then validate this training at the Joint Readiness Training Center or the National Training Center with major exercises in preparation for deployment.

Rehearsals are key. The radio rehearsal is a valuable tool. In the case of rehearsals for CAS, radio messages will focus on the procedural aspects of CAS control. Voice procedures are important during an attack brief to a pilot, so it is imperative to



Joint Fires Observer books sit out while a JFO student trains during a simulation at Fort Sill, Okla., April 12, 2010. (Photo by Jason Kelly, U.S. Army)

"JFOs should also study and review joint, U.S. Army, and U.S. Air Force publications which will help build a body of knowledge that is needed to be a thorough warrior."



SPC James D'Amico (left) and SGT Timothy Boggs from the 1st Stryker Brigade Combat Team, 25th Infantry Division call for support from air assets during Atlantic Strike VII at Avon Park Air Ground Training Complex in Avon Park, Fla., June 18, 2008. Atlantic Strike is a joint forces training exercise involving Joint Terminal Attack Controllers from the U.S. Army, Air Force and Marines. (Photo by SSgt Stephen J. Otero, U.S. Air Force)

practice the proper calls. The flow of communication during a CAS mission is fast paced and follows a pattern built around information exchanges. Practice the information flow until it becomes ingrained.

Another useful technique is to pull out a map and practice a target 'talk-on' with someone with the same map in another room. What might be thought of as perfect 'talk-on,' may not be understood by another person listening in, so it's important to practice with a team member. After the radio calls come smoothly, it is time to take the training to a simulator.

Simulators are a great tool to re-enforce CAS procedures. A variety of missions can be built using a simulator and is the perfect place to try new techniques. Another nice thing about simulators is that the systems provide instant visual and auditory feedback to see if desired results were achieved. Also, if the simulation was tanked – just reset and do it again. There are a variety of simulators available in most Army garrisons, or work with the local Air Force tactical air control party to join in their training.

Live-fly training. I remember the first time I talked to an actual aircraft I got tongue tied. Looking at a piece of ground and telling the aviator to hit a particular target is not a simple task. It is important for a Fires observer to train with actual aircraft as much as possible to work through this issue. Extensively utilize live-fly training at local ranges. Local ranges are inexpensive to utilize and easily scheduled. However, do not disregard unfamiliar ranges that provide new targets and challenges. Traveling to off-station range is highly encouraged if funding can be secured to make it happen.

Whatever range the training takes place on, it is important to watch a target explode because it provides instant feedback. This is one of the reasons the JFO should accompany JTACs when they conduct CAS training. Local ranges present a good balance for the JFO. The local impact range has familiarity and is the range that JFOs routinely perform calls for fire missions on. However, conducting a CAS mission is a different mission set for most fire support professionals. Initial JFO training on a local range may allow JFOs to focus specifically on JFO skill-set building and minimize friction caused by range unfamiliarity. Though home-station training can

be effective, it's important to remember to mix it up if possible. A local impact range will eventually cease to provide a challenging training environment. Before long, the joint terminal attack controller and joint fires observer can engage targets on the range from memory.

Case in point, I can control a mission on Redleg Range on Fort Polk, La. to this day – seven years later. If funds are available, a change in training locations can provide challenges with new conditions and target arrays.


More bang for the buck. It's important to note, the Joint Forces Command has put aside money to help defray training costs. The Joint Terminal Attack Controller -Joint Fire Observer Continuation Training Program aligns disparate JTAC/JFO units with CAS aircraft and provides temporary duty funding, otherwise not available, to enable live training to enhance JTAC proficiency and maintain currency. In order to apply for funding, the training event must involve two branches of the military. Military lodging can be provided.

Also, the event must be scheduled during periods of historical favorable weather. The last step is to provide an after action review of the training event. The link to request funds can be found on Air Force Knowledge Now. Users, via a CAC card, must create an online account to access the AFKN system.

Stay in the game. A warrior should be ready to perform with little to no warning. This ability does not happen by itself. Stay ahead of the game by not allowing JFO skills to be dulled by the daily grind. The warrior reaches a high level of performance with continuous training. Growing JFO skills takes time and effort, but the end result is a capable combat asset for any commander. Get in the books and utilize all training venues and material that are readily available. A thorough training program that builds upon the knowledge, skills and abilities acquired at Fort Sill cannot be understated. Quality training at home station allows concentration on fine-tuning techniques at NTC or JRTC. The formal JFO course held at Fort Sill is just the beginning of a JFO's journey.

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Employing joint Fires in Afghanistan



SPC Zackery Cely, from Company A, 1st Battalion, 4th Infantry Regiment, provides security from a tower on Forward Operating Base Lane in the Zabul province, Afghanistan, October 2009. (Photo by Tia P. Sokimson, U.S. Army)

By LTC John C. Allred

Joint Fires lessons are critical to the success of our Army's ongoing operations in the contemporary operating environment. The joint Fires assets and units in this article detail how Fires is an essential partner and an enabler to maneuver units.

The basis of this article was my experiences as the battalion commander for 2nd Battalion, 506th Infantry /Team Paktika East, which was operating as part of the 4th Brigade Combat Team, 101st Airborne Division (Currahee), in Paktika Province, Afghanistan, July 2008 through March 2009. Team Paktika East consisted of joint forces, who were deployed over 10,000 square kilometers. They served on twelve outpost/observation posts, as well as along a 240-kilometer section of the Afghan-Pakistan border.

Our area of responsibility included terrain ranging from high-desert plains to mountains up to 10,000 feet in altitude. Movement between outposts included distances and a terrain that could only be traversed in hours—not minutes. Employing joint Fires was the primary way our task force could rapidly influence the tactical

situation for units who experienced enemy contact across this dispersed area of responsibility.

The risks of employing large-caliber, joint munitions while fighting a counterinsurgency in a sovereign country are many. Paramount to success in counterinsurgency tactics is the staff's and commanders' ongoing assessment of risk versus reward of joint Fires use, and mitigation of civilian casualties. A commander must always explore all non-lethal means to effect and influence the enemy.

We found that often these non-lethal effects were more powerful in accomplishing our objectives, pursuing the lines of effort of governance and development, and were the focus of most of the battalion's operations. When a unit leader estimated he could not handle the fight with organic assets, aerial and indirect fires were often the only enablers available to quickly tip the balance in the favor of coalition forces.

The danger of misapplication of joint Fires use is the loss of support of the indigenous population through collateral damage. Even with careful and precise consequence management, these failures will rapidly compromise whatever progress

a unit has made in its area of responsibility. Also, the potential corrosion of Soldier and leader morale after inflicting collateral damage cannot be understated.

Mission assets. Tools that enabled us to rapidly employ joint Fires while minimizing collateral damage were Remotely Operated Video Receivers and Sniper Advanced Targeting Pods. During our units' deployment to Afghanistan, Sniper ATPs were mounted on all U.S. close air support-designated aircraft. The battalion also received additional ROVERs to support company-level units upon arrival to Afghanistan. The Sniper ATP transmitted to the ROVER the same high-magnification images as seen in the CAS cockpits, allowing the battalion operations center, company command posts, and CAS pilots access to the same information and promoting situational understanding across multiple echelons of leaders. This enabled more precise and safer employment of precision munitions against insurgents.

Signals intelligence-cuing also played an important role in the battalion's joint Fires employment. Various off-the-shelf unclassified signals collection devices such as commercial FM radio scanners enhanced the units' situational awareness down to the platoon level. This allowed preemptive use

of joint Fires to destroy enemy forces before they initiated contact where friendly forces could not execute direct fire and maneuver effectively: such as an enemy in ambush positions where steep and rough terrain prevented friendly forces from effectively and quickly flanking; insurgents moving into position to set up indirect fire systems multiple kilometers distant from coalition outposts. All Signals intelligence-cued Fires also included a hasty analysis of targets considering factors like: proximity of historic firing points and ambush positions; comparison to established patterns of enemy activity; use of a lexicon of enemy code words and phrases to better understand our opponents' intents; proximity to known or observed civilian population concentrations; and always observation of target area to positively identify enemy and preclude killing of civilians.

Applying joint Fires. A critical aid in the application of joint Fires was the Precision-Strike Suite Special Operations Force software. This application graphically portrayed weapons effects on overhead imagery for the target grids of indirect fire missions. The ability to understand weapons effects, in relation to the terrain, by the unit's leadership facilitated the rapid employment of joint Fires in support of units receiving contact. On-scene commanders may not have been able to see across the highly-varied terrain of Afghanistan for nearby villages at all times, though they may have seen their intended targets clearly. PSS-SOF, in combination with other overhead imagery, enhanced the battalion's ability to mitigate and prevent civilian casualties, which was a vital and essential measure needed for the confident and timely application of joint Fires in the current operating environment.

One of the most important actions a task force commander may take to ensure timely and accurate joint Fires is giving clear guidance to subordinate leaders. The first step in this process is a frank discussion with the next highest senior commander of what you are both comfortable with, such as levels of authority for release of different types of munitions, and under what conditions are they used. Once I had this guidance, I published it in the simplest format possible and ensured my subordinate leaders also understood.

Ensuring timely and accurate Fires. The battalion and company command posts, exercised Fires clearance

drills and perfected mediums for passing Fires mission requests and resulting Fires orders. Due to the nondoctrinal dispersion of our artillery (four, two gun-platoons and Fires directions centers at four outposts) and a resulting shortage of communications platforms, our unit used Mardam-Bey internet relay chat to distribute information from the Advanced Field Artillery Tactical Data System. We also generated fire orders that were simultaneously observed by sender and receiver which facilitated situational awareness amongst three echelons of the command.

An effective method of joint Fires employment is teaming of multiple assets,

"The ability to understand weapons effects, in relation to the terrain, by the unit's leadership facilitated the rapid employment of joint Fires in support of units receiving contact."

specifically unmanned aerial systems, indirect fire systems and fixed-wing close air support sorties as part of an enhanced joint air attack. One example of our battalion employing JAAT was at a periodic daytime insurgent checkpoint, which had been identified by multiple human intelligence sources as suspicious.

At this unlawful checkpoint, located halfway between the battalion FOB and our Alpha Company COP, Afghan civilians were harassed by and forced to pay tolls to local insurgents.

Mounted and dismounted ground patrols had not caught the AAF checkpoint in action due to the enemy's early warning system, established in the surrounding sympathetic tribes (specifically the Zadran Tribe, which was the parent tribe of the Haquani's insurgent network) who lived in the area.

To counter the AAF early warning system, we employed a Shadow UAS to observe the area of interest designated for the checkpoint. The UAS ground station and operators were co-located with our operations center. After several missions, the Shadow spotted a platoon-sized element of suspected insurgents, not in uniform, armed with multiple crew-served weapons, stopping civilian vehicles and taking goods and money from them.

Once we confirmed that our Company A and their collocated Afghan national army and police counterparts were not patrolling in that area, we positively confirmed enemy activity.

As we knew from experience, a ground patrol could not get to the checkpoint with the element of surprise.

In response to observing the insurgent activity we executed the following: alerted the nearest outpost with indirect fire assets that could range the target (Company B with its two, 155 mm M198 howitzers); the battalion Fires cell and Joint Terminal Attack Controllers coordinated the airspace above the target to maintain UAS observation, flight of the 155's rocket-assisted projectiles, and ingress of CAS (two F-15s aircraft).

While waiting for the civilian vehicle traffic to clear the target area, with sufficient space to prevent collateral damage, Task Force JTAC oriented F-15 pilots to the target area. Critical to maintaining the element of surprise was keeping the UAS and the CAS assets far enough away in altitude and range from the target, to ensure their engine sounds would not alert the enemy, and yet close enough for their respective optics to maintain continuous surveillance of the objective.

More important was the co-location of the UAS operators with the battalion operations center, providing real-time views of the target area from the perspective of the F-15 pilots (through ROVER) and the UAS (through the ground station). After a hasty analysis of the terrain and weapons effects with PSS-SOF, we initiated the attack with an immediate suppression-fire mission to fix the enemy. This was immediately followed by each of the F-15s hitting the target in succession with their 20 mm cannons. Within the next 24 hours, we received confirmation, through human intelligence, we had killed eight-enemy fighters and severely wounded an additional 22 insurgents. The effects of this joint Fires application, deterring enemy recruitment and action in the area, resulted in no additional, unlawful checkpoints or other overt actions, for more than a month after the engagement.

Lessons learned. We took several lessons learned away from this action, learning first-hand that one of the benefits of full-time partnering with the indigenous security forces to include rapid clearance of fires. The synergy we created, by teaming our assets, allowed us to circumvent the great advantages our enemies' had in our current operating environment.

Later in our deployment, we had another success when our task force coordinated CAS and rotary wing attack aviation teaming in response to an enemy, 80-plus personnel attack on a platoon combat outpost. The

COP sat on a high bluff overlooking a large, two-village complex agricultural area, which was also located at the western exit of a major insurgent infiltration route, reaching all the way back to insurgent base areas in Pakistan's autonomous border tribal areas. One of the major tribes located in the valley was sympathetic to the insurgency, but the COP location enabled the battalion to disrupt infiltration in this area.

Shortly before midnight, the platoon located at the COP spotted movement into the bazaar west of the outpost, as well as on a hill one kilometer to the north. The platoon executed a stand-to and alerted the Charlie Company commander at the FOB, which was located 25 kilometers to the south. The commander then alerted his 1st platoon in case he needed a quick-reaction force, and requested through the battalion operations center CAS and an air weapons team (which included two AH-64 Apache helicopters).

Shortly after these actions, the enemy opened fire from five support-by-fire positions which were located on a large hill to the north, and arrayed on the west and on the south of the COP. From their positions, the platoon leader assessed the enemy was attempting to suppress the crew-served weapons located on the COP, while the insurgents executed an infiltration attack on the COP from a deep wadis (a dry streambed) located 1,900 meters to the northeast. The COP's 120 mm mortar fired two rounds and destroyed the enemy crew-served weapon firing from the north; the most dangerous of the enemy's support-by-fire positions.

The platoon effectively suppressed the other positions with a combination of crew-served and small-arms direct fire, and then the enemy attempted to break contact. While the enemy shifted into the large river wadis located between the village complexes, the platoon used their Tube-Launched, Optically-Tracked, Wireless-Guided Improved Acquisition Systems to maintain continuous positive identification of the insurgents and orient two A-10s onto the enemy. The battalion operations center observed the A-10s' efforts through the Sniper ATP-ROVER medium to line up for a strafing attack on the retreating insurgents. However, to avoid damage to Afghan homes and civilians, we ordered the CAS sortie to high orbit to maintain observation and PID of the retreating insurgents, until the inbound AWT could be oriented to the target.

After the AWT arrived and received an orientation to the terrain and situation, we task organized one AH-64 and one A-10 per team. Originally in a 21-man element, the insurgents, who had broken into four groups,

were then tracked by the A-10s' lasers, which designated and guided the AH-64s into position. By early morning, the two aerial teams had tracked and destroyed all the insurgents with the AH-64 30mm cannon fire. The AH-64 was the best system to finish mission in order to mitigate collateral damage. Charlie Company launched a patrol at first light and found multiple destroyed weapons and equipment in the various locations where the AH-64s had engaged the enemy.

Teaching points. This action offered us multiple teaching points and lessons learned such as a sound defensive preparation and good observation plans, conducted by the platoon ensured the outpost would not be over-run. The platoon's skilled use of observation and marking devices also proved critical in maintaining positive identification of the enemy. There was also effective battle target hand-offs from observers to shooters, facilitated by the platoon leader, company commander, JTAC and aircrews, of the rotary fixed-wing aircraft. All the actions that night ensured no identified enemy escaped.

Tools and asset accessibility. Most of the tools detailed in this article have recently become available to echelons below brigade in the current conflict. As counterinsurgency is a bottom-up fight, it is essential to push these assets down with the proper subject-matter experts and help junior leaders employ them.

Critical to successful use of all these tools is knowledge, of available capabilities and training assets. Armed

with this knowledge, ground commanders may successfully employ joint Fires in a non-linear, non-contiguous environment against insurgents in a highly-restrictive terrain. Also significant to the employment of all these assets is the first element of battle command: airspace command and control, AOR situational understanding, which in turn enables airspace control; positive identification of the enemy, and observation of Fires. Most importantly, the battalion commander in charge, of a specific area of operation, must give clear guidance that enables the appropriate, timely, and effective use of joint Fires. Through intent-based orders, a battalion commander empowers subordinate leaders to maximize their creativity and initiative within the commander's intent. For all the successful operations detailed in this article I give full credit to the subordinate leaders and staff on our team who enabled and executed them.

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SGT Mason Levo, Charlie Company, 2nd Battalion, 502nd Infantry, 2nd Brigade Combat Team, 101st Airborne Division, readies himself before movement from Kandahar City to the Panjwaii District Center, Kandahar province, Afghanistan, Oct. 6, 2010. (Photo by Cpl Carol A. Lehman, U.S. Army)



Operational culture in the US Army: The Fires Center of Excellence Culture and Foreign Language Strategy sets the standard for the rest of TRADOC, Army

By Dr. Mahir J. Ibrahimov

Globalization, Internet networking, and instant access to worldwide news media have proliferated the merging or partnering of ideological groups that oppose the U.S. and/or U.S. policies. These groups operate in pan-regional and multi-regional battle space comprised of numerous cultures, both friendly and hostile. It appears likely that during the next decade the operational environment of our troops will be characterized by persistent and unpredictable conflicts in battle space teeming with multiple foreign cultures. The Army must be prepared to effectively

operate along with our multinational and host-nation partners against sophisticated and adaptive adversaries in order to achieve U.S. objectives. This dictates that Soldiers of every rank must become ‘culturally astute’ about the areas where they operate.

Our junior leaders face adversaries who employ multiple and dynamic combinations of conventional, irregular, terrorist and criminal capabilities as they engage our Soldiers or attack our strategic interests. These hybrid threats can be expected to use a full spectrum of options, including every political, economic, informational, and military measure at their disposal. Combating these threats will necessitate creative solutions, and such solutions will require military forces that are adaptive

MAJ Paul Bollenbacher shakes hands with a Si Av village resident from the Bawka district in Farah province, Afghanistan, June 12, 2010. Bollenbacher is the director of the Provincial Reconstruction Team Farah Civil Military Operations Center. (Photo by SrA Rylan K. Albright, U.S. Air Force)

enough to function in a variety of situations and against a myriad of threats with a diverse set of national, allied and indigenous partners. It will require leaders who can anticipate change, create opportunities and achieve results.

The Army’s Leader Development Strategy prescribes the future security environment will require leaders “who *understand* the context of the factors influencing the military situation, *act* within that understanding, continually *assess and adapt* those actions based on the interactions and circumstances of the enemy and environment, *consolidate* tactical and operational opportunities into strategic aims, and be able to effectively *transition* from one form of operations to another.” As field artillerymen and air defense artillerymen support full-spectrum operations, challenges in how we conduct fire support operations will require agility and innovation as new adaptive threats that employ a mix of new and old strategies and technologies emerge.

To prosecute the fight and accomplish the assigned mission, the U.S. Army Field Artillery and Air Defense Artillery will need leaders who are adaptive, competent, and capable of operating with confidence in these ambiguous and complex environments. These leaders must be able to operate in decentralized organizations; be able to network with their joint, interagency, intergovernmental, and multinational partners; and be able to develop plans and operations that win the support of the population while defeating the

enemy. They must have an understanding of how other people think and act, as well as an appreciation of cross-cultural diversity and beliefs. This cultural sensitivity is just as important within a Soldier's organization and with other sister services and allies, as it is in engaging indigenous people and threats who exist within the contested operational environment. In order to meet these operational and environmental demands, we must enrich our leader training and education by leveraging and adapting training methodologies to replicate complexity and hybrid threats in the institutional classroom, at home-station and while deployed.

Assessing the field artillery and air defense artillery community's requirements, we must develop leaders who have the core competencies to visualize, articulate and build partnerships and alliances; to effectively lead organizations; and be able to adapt to unanticipated, changing and uncertain situations.

The Army Culture and Foreign Language Strategy. To meet these operational and cultural challenges, the Army's goal as defined in the Army Culture and Foreign Language Strategy, dated Dec. 1, 2009, is to develop and maintain expeditionary forces that are led by Soldiers who are ready to deploy and operate effectively anywhere in the world across the full spectrum of conflict. This will require leaders who have sufficient cross-cultural, regional and foreign language competencies to enable the successful execution of military operations...not only an understanding of the culture and language in a particular area, but an understanding of the implications these considerations have on how operations are conducted. To achieve this goal, leaders and Soldiers must increase their cultural knowledge through operational experience, self-development, or as a learning opportunity during their professional military education. Within the Training and Doctrine Command, this will require schools and centers to develop, integrate and deliver cross-cultural education within their respective programs of instruction.

Cross-cultural competence. This is a set of knowledge, skills and attributes that enables Soldiers to adapt effectively in any environment. It can develop over time through experience, but can be accelerated by principled learning methods. Cross-cultural competence enables negotiation and persuasion; mediation and conflict resolution; leadership and influence; cultural evaluation, synthesis, and predictive analysis during staff planning;

and other abilities that pertain to a specific geographic area.

Additional characteristics of cross-cultural competence includes awareness of culture and of one's own cultural context, general cross-cultural schema and culture-analytic models, and an increasingly complex understanding of the impact of culture on military planning and operations (knowledge).

Critical aspects of cross-cultural competence are interpersonal and communication skills, flexibility in seeing different cultural frames and perspectives, and the ability to regulate one's own reactions (skills).

Necessary ingredients of cross-cultural competence are non-ethnocentric attitudes, motivation to learn about culture and to update one's knowledge base as new information is encountered and the ability to empathize (attributes).

Regional competence. Another major component of the culture development program is regional competence. This concept is defined as a set of knowledge, skills, and attributes related to a particular country, region, organization, or social group, which enables effective adaptation to that specific culture. Additional characteristics include awareness of the historical, political, cultural (including linguistic and religious), sociological (including demographic), economic, and geographic dimensions of a foreign country, global region, or other specific culture.

Acquiring regional competence enables negotiation and persuasion; mediation

and conflict resolution; leadership and influence; cultural evaluation, synthesis, and predictive analysis during staff planning; and many other abilities that pertain to a specific area of operations.

It's also the ability to adopt perspectives common to that culture; ability to regulate one's own behavior, communication, and emotional expression to match cultural norms where appropriate. Includes positive attitudes toward the population and motivation to learn about the culture, to include how they make decisions.

A combination of both competencies acquired during the cycle of training, education and experience would help overcome the 'culture shock,' and give Soldiers the ability to adjust to an indigenous culture as quickly as possible to get the mission done.

Governance. The TRADOC Deputy Chief of Staff, G-2 serves as the executive agent for the CG, TRADOC as culture and foreign language lead for the Army. The commander, Combined Arms Center, TRADOC is the lead for implementation of culture and foreign language career development within all TRADOC organizations. The Army Culture and Foreign Language Management Office is delegated ACFLS implementation management authority from the TRADOC DCS G-2. Fragmentary Order 18 (weekly) to OPORD 09-008, TRADOC Campaign Plan 10-11 outlines specific tasks to TRADOC commanders, staff and subordinate organizations on implementing the Army Culture and Foreign Language Strategy. TRADOC centers and schools, in their roles



SSG Caleb Welch of 1-178th Field Artillery Battalion, South Carolina Army National Guard interacts with children on a rural road in Laghman province, Afghanistan, during an engineering assessment, Aug. 18, 2010. (U.S. Army photo)

as proponents, will be integrally involved in defining common education and training required to generate the necessary culture and foreign language capability for the Army. Proponents will also determine the culture and foreign language capabilities required in operating force units for which they are the proponent.

The ACFLS goal is to establish a baseline of culture and foreign language capabilities for all leaders and Soldiers to support the accomplishment of unit missions. The strategy's end state is to build and sustain an Army with the right blend of capabilities to facilitate full spectrum operations. The resulting force will have the ability to effectively conduct operations with and among other cultures.

U.S. Army Field Artillery and Air Defense Artillery Schools. The FCoE CFLP's desired outcome is to provide the Army with technically and tactically proficient and expeditionary-minded field artillery and air defense artillery leaders who can operate in a joint, interagency, intergovernmental and multi-national environment across the full spectrum of operations and with a level of competence necessary to perform assigned tasks in a specific geographic area.

For field artillery and air defense artillery Soldiers and leaders, it is desired they possess a sufficient level of cross-cultural and regional competence to effectively accomplish duties at their assigned level, and to have the cognitive, interpersonal and cultural skills necessary to make sound judgments in these complex environments. For target mensuration and collateral damage estimation, it is important that all artillerymen and air defense artillerymen understand the effects that culture, people and civilian factors have on the targeting process.

The FCoE CFLP will leverage the capabilities at its disposal to establish the initial foundational training and education for field artillerymen and air defense artillerymen to be able to competently and confidently lead Soldiers. This includes the introduction and development of a basic awareness in culture and languages.

Constraints, limitations and risk. Time available and specific course length for students attending field artillery and air defense artillery initial military

training and follow-on leader development professional military education courses are the principal constraints the faculty must contend with in order to meet the ACFLS desired outcome. Learning objectives will be achieved through modification of existing program of instruction, incorporating tasks into collective training events (capstone exercises) and through professional reading, critical writing requirements, and after-duty language training and civilian education opportunities.

Resources and funding for additional instructors, role players and lesson materials are limited. We must leverage existing cultural training, language, civilian academic partnerships and virtual gaming solutions to support USAFAS and USAADAS ACFLS learning objectives.

Inclusion of ACFLS learning objectives into course curricula should complement and not put at risk common core and artillery

“Cross-cultural training and education should build on the foundation of an individual's existing leader attributes which in turn reinforces the core leader competencies...”

technical training objectives.

Training approach. In order to build and sustain an Army with the right blend of culture and foreign language capabilities to facilitate full-spectrum operations, we must leverage existing professional military education programs, organizational and functional training and continuous life-long learning through a combination of training, education and experiential opportunities to attain a level of awareness, understanding and expertise. As we determine how to best implement the ACFLS, we will use the current leader development strategy that serves as a base for our existing instruction within the school and in the growth of our leaders.

Cross-cultural training and education should build on the foundation of an individual's existing leader attributes which in turn reinforces the core leader competencies of leading others, developing oneself and achieving results:

Character. A leader of character internalizes the Army Values, lives by our Professional Military Ethic, reflects the Warrior Ethos and displays empathy towards Soldiers, families and those people affected by the unit's actions. Competence places an individual in position to lead – character makes him or her an effective leader.

Presence. A leader of presence has credibility, exudes confidence and builds trust. Presence is conveyed through actions, appearance, demeanor and words.

Intellect. A leader of intellect has the conceptual capability to understand complex situations, determine what needs to be done and interact with others to get it done. Leaders must have the ability to reason, to think critically and creatively, to anticipate consequences and to solve problems.

At the USAFAS and USAADAS, the development of cultural awareness and/or understanding will be the principal objective and introduction to a foreign language (basic phrases and elemental proficiency) is a supporting effort. In order to achieve a higher level of cultural understanding/expertise or language proficiency, individuals would need to leverage other professional military education, civilian education and self-development programs. (See figures 1.1 and 1.2 on page 25.)

Cultural awareness: minimal level of regional competence necessary to perform assigned tasks in a specific geographic area; able to describe key culture terms, factors and concepts. Basic understanding of how foreign culture might affect the planning and conduct of operations is desirable.

Cultural understanding: well developed cross-cultural competence in a specific region. A leader must be able to anticipate the implications of culture and apply relevant terms, factors, concepts, and regional information to tasks and missions. Familiarity is necessary of a specific region's economic, religious, legal, governmental, political and infrastructural features, and awareness of regional sensitivities regarding gender, race, ethnicity, local observances and local perception of the U.S. and its allies is paramount.

Cultural expertise: advanced level of cross-cultural competence in a specific geographic area. This generally entails some

Figure 1.1 U.S. Army Fires Center of Excellence Culture and Foreign Language Program Strategy and Implementation Plan

Self assessment:

- Employ Defense Language Institute assessment (Defense Language Aptitude Battery) tools
- Prepare for follow on assignment
- Tailor to individual's learning style (Myers-Briggs Type Indicator)

Skills development (Training):

- U.S. Central Command/Pacific Command regional focus
- Assignment oriented training elemental language proficiency (Level 0+/1)
- Proposed languages (Dari/Pashto, Arabic, Korean and Russian)
- Cameron University, Oklahoma University and Oklahoma State University guest lecturers
- International Student Division/liaison officer briefs

Situational application (Education):

- Assignment oriented training cultural awareness focus
- Strategic university partnerships
- Lectures/seminar panels
- Critical thinking writing requirements

Experiential learning (Experience):

- Redleg War (key leader engagement/civilians on the battlefield)
- Role playing scenarios



degree of proficiency in a language; skills that enable effective cross-cultural persuasion, negotiation, conflict resolution, influence, or leadership; and an understanding of the most salient historic and present-day regional structural and cultural factors of a specific geographic area. (See figure 1.3 on page 32.)

In order to achieve this goal, FCoE CFLP will incorporate the following learning objectives in its initial military training and follow-on leader development professional military education courses:

Learning Objective 1 (Character).

Demonstrate interaction and cross-cultural communications skills in order to effectively engage and understand people and their environment. Demonstrate a level of cultural awareness that includes a positive, openness to other people, an understanding of prevailing values, beliefs, behaviors and customs, and a desire to learn more about cultures and language. This includes an introduction to a language that supports current military operations with the intent to promote additional study through self-development at the institution, at home-station or at an academic university.

Learning Objective 2 (Presence).

Demonstrate communication, influence and negotiation skills essential for leaders to effectively operate in a JIIM environment.

Leverage the knowledge gained by

Figure 1.2 U.S. Army Field Artillery School Culture and Foreign Language Program

Course	Course length	Culture and foreign language focus
Captains Career Course	24 weeks	36 hours
Basic Officer Leader Course B	20 weeks	10 hours
Warrant Officer Advanced Course	10 weeks	15 hours
Warrant Officer Basic Course	33 weeks	22 hours
Senior Leader's Course/ Advanced Leader's Course	4-8 weeks	2.5 hours
Advanced Individual Training		1 hour

challenging students to employ skills to deal with ambiguous and complex situations, to regulate one's own behavior, and to use interpersonal abilities to deal with people from one's own or other cultures. This includes an understanding and ability to engage other joint and allied military personnel, and host country indigenous leaders with a moderate level of confidence.

Learning Objective 3 (Intellect).

Demonstrate a familiarization in a geographic region of current operational significance. Leverage critical thinking and cognitive skills through organizing information that supports cultural self-awareness. Depending on level of leader development PME, expand cross-cultural competence skills by gaining an awareness or understanding of a geographic area that

highlights the implications of a region's economic, religious, legal, governmental, political and infrastructural features, and of sensitivities regarding gender, race, ethnicity, local observances and local perception of the US and its allies.

Apply relevant planning considerations, terms, factors, concepts and geographic information to mission planning and in the conduct of operations. This includes leveraging other TRADOC and DOD schools, partnerships with universities and academia, gaming technology and opportunities that stress students' ability to concisely and persuasively speak and write, to engage in discussions, and employ cognitive reasoning and thinking skills.

Execution of training. The following information provides USAFAS,

USAADAS and NCO Academy with a plan for the conduct of culture and foreign language training and education. The following implementation plan is consistent with current Department of the Army and TRADOC leader development and cultural awareness initiatives to incorporate culture and foreign language into institutional training and education at the schools and centers of excellence.

Learning objectives and their associated tasks:

Learning Objective 1 (Character): Demonstrate interaction and cross-cultural communications skills in order to effectively engage and understand people and their environment.

- Task 1: Understand one's self; internalize the Army Values, our professional military ethic and Warrior Ethos.

- Task 2: Assess cultural perspectives and values different from one's own; compare differences and sensitivities in order to modify one's behavior, practices and language; and operate in a multi-cultural environment.

- Task 3: Apply cross-cultural communication skills.

Learning Objective 2 (Presence): Demonstrate communication, influence and negotiation skills essential for leaders to effectively operate in a JIIM environment.

- Task 1: Develop communication skills that enable effective cross-cultural persuasion, negotiation, conflict resolution or influence.

- Task 2: Apply communications skills during cross-cultural negotiations.

- Task 3: Develop confidence in learning and applying language skills.

Learning Objective 3 (Intellect): Demonstrate a familiarization in a geographic region of current operational significance.

- Task 1: Apply culturally relevant terms, factors, concepts and regional information in the development of mission plans and orders.

- Task 2: Assess and describe the effect that culture has on military operations specific to countries or regions of operational significance to the US.

USAFAS and USAADAS instructors will use a variety of learning-enabled training, education and self-development techniques to teach students attending initial military training and professional military education courses at Fort Sill. Cultural instruction may be programmed, integrated into other training objectives, or as reinforcement through the use of self-paced learning tools or as research for presentations and writing requirements.

Facilitated instruction. Classroom instruction will rely on instructor-

led discussions and facilitated problem-centered exercises to assist the student in understanding basic cultural awareness and then by challenging him/her through use of relevant scenarios they may encounter in their unit and/or during a deployment. Facilitated learning will focus on initiative, critical thinking and accountability for their actions. Small group instructors will receive cultural training assistance from the FCoE Cultural Advisor to enable them to better present information, lead discussions and to facilitate the problem-centered exercises. The instruction will leverage blending learning resources and augmented by professional reading requirements, self-paced technology-delivered instruction and research outside the classroom.

Web-enabled instruction, simulations and gaming. The U.S. Army Intelligence Center, Marine Corps University, Defense Language Institute Foreign Language Center, and Near East and South Asia Center for Strategic Studies at the National Defense University all have a variety of on-line instructional material that is available for instructor use. USAFAS and USAADAS currently has access to and using the Army 360 Cultural Trainer as well as VBS2 Tactical Dari, Pashto (Afghanistan) and Iraqi Arabic simulation and gaming tools to augment instruction. As other culture and foreign language avatar and interactive simulation programs become available, we will evaluate and leverage those educational tools to augment classroom instruction and self-development opportunities.

Role-playing and key leader engagement scenarios. Instructors will leverage the knowledge gained by challenging students to employ their interpersonal skills as part of in-class role-playing practical exercises and formal key leader engagement opportunities. The key leader engagement scenario will require an individual(s) to use an interpreter to engage other coalition military/police members and host country indigenous leaders in order to address a particular problem. This engagement will use mock-up facilities and capstone field exercises to reinforce the learning objectives and provide each student with feedback through an after-action review. Both role-playing exercises and the key leader engagements will result in constructive feedback to the individual.

Academic lectures and seminar panels. We currently have partnerships with several local universities, most notably with Cameron University, Oklahoma University and Oklahoma State University. These universities support

Figure 1.3 TRADOC Cultural Competency Categories



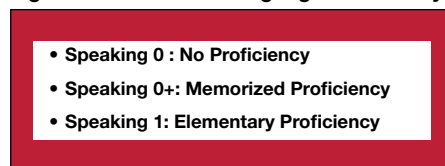
USAFAS instruction by providing lectures and seminars for our students on topics that address geo-political and cultural trends affecting the Middle East, Northeast Asia and other areas of operational significance to the Army to include specific discussions on Afghanistan, Iraq and Korea. The target audience for the lectures and seminars are the noncommissioned officers (Advanced Leader Course/Senior Leader Course, warrant officers (Warrant Officer Basic and Advanced Courses) and commissioned officers (Basic Officer Leader Course and Captains Career Course). The lecture-series is scheduled as part of commandant's time and is conducted in sixty-to-ninety minute sessions once every six to eight weeks. We also have ongoing partnerships with DLI, TRADOC Culture Center, Military Intelligence Center at Fort Huachuca, Ariz., among other institutions and centers.

Leveraging the International Student Division and FCoE liaison officers. All BOLC-B and CCC students receive country and cultural briefs from their fellow international students and assigned FCoE liaison officers during the resident course. Additionally, monthly "Know Your World" program assists students in better understanding the culture and geo-political significance of the country from where their classmate comes from and further expands the student's awareness of other cultures.

Analytical writing requirement. To address the need to develop critical thinking and improve written communication capabilities in our leaders, a three-to-five page analytical paper (double-spaced, 12-pitch, times new roman) will be required from ALC, SLC, WOBC, WOAC, BOLC-B and CCC students that addresses a cultural or geo-political topic of military operational significance to the U.S. The papers will be graded by USAFAS, USAADAS and NCOA faculty members and feedback will be provided to the student. The FCoE is currently working with our university partners to contract and/or hire a person to support our written communications requirements.

Professional reading program. A critical component of our leadership development and cultural awareness efforts includes a professional reading program (professional reading list is located on the FKN-accessed CFLP web-site). All BOLC-B and CCC students are encouraged to read one of three books based on their follow-on assignments: "The History of the Modern Middle East," by William L. Cleveland and Martin Bunton; "Taliban: Militant Islam, Oil and Fundamentalism in Central Asia," by Ahmed Rashid; or "China,

Figure 1.4 Elemental Language Proficiency



Japan, Korea: Culture and Customs," by Ju Brown and John Brown.

Foreign language. The goal of the FCoE Culture and Foreign Language Program is to introduce foreign language to students attending PME instruction and to give them the opportunity to achieve an elemental language proficiency of Level 0+, 1 (See figure 1.4.) in a language of military operational significance. This includes opportunities to learn Afghan Dari, Pashto, Iraqi Arabic, Korean and Russian prior to reporting to their unit assignments. All PME students are issued and provided basic instruction on the use of "Rosetta Stone" or multi-platform tactical language software programs in tactical Iraqi, Dari, and Pashto. In addition, those students who are interested in receiving additional language instruction will be provided the opportunity to receive training on Afghan Dari, Pashto, Iraqi Arabic, Korean and Russian as part of a twelve-week, 24-to-36 hour program. This opportunity is voluntary and instruction is provided through internal school assets and assistance from the DLI Foreign Language Center during off-duty language sessions coordinated by the FCoE Culture and Foreign Language Advisor. The DLI Foreign Language Center also provides a web-site to facilitate the language training and sustainment proficiency which can be found at <http://www.dlilfc.edu>.

Additional resources. A Culture and Foreign Language Resource Center is established in the Morris Swett Technical Library within Snow Hall. Students are provided access to computers, cultural resources and professional reading material to facilitate research, learning and language proficiency.

The Culture and Foreign Language Program website is located on the Fires Knowledge Network. The website contains cultural awareness and foreign language resources, DLI Foreign Language Center resources, information on past lectures, foreign languages guides and other significant links. The website is available with an AKO login on FKN at <https://www.us.army.mil/suite/doc/21617522>.

Course implementation. Following is the roll-up of Culture and Foreign Language Program of instruction hours (programmed). (USAFAS is taken

as an example to gradually promulgate to the USAADAS):

- Field Artillery Captains Career Course: 36 hours
- Field Artillery Basic Leader Course: 10 hours
- Field Artillery Warrant Officer Advance Course: 15 hours
- Field Artillery Warrant Officer Basic Course: 22 hours
- 13B/13D/13F/13M/13P/13R/13T Senior Leader Course: 2.5 hours
- 13B/13D/13F/13M/13P/13R/13T Advance Leader Course: 2.5 hours
- Advanced Individual Training: one hour

Field Artillery Captains Career Course (24 weeks). USAFAS' desired outcome is for FA captains to demonstrate an understanding of culture, how to leverage that knowledge in a IIIM environment and with a level of competence necessary to serve as staff officers and leaders within a complex environment. (See figure 1.5 on page 34.)

Field Artillery Basic Officer Leader Course (18 weeks, 4 days). USAFAS' desired outcome is for FA lieutenants to demonstrate a basic awareness of culture, how to leverage that knowledge in a IIIM environment and with a level of competence necessary to serve as company fire support officers and leaders within a complex environment. (See figure 1.5.)

Field Artillery Warrant Officer Advance Course (10 weeks). USAFAS' desired outcome is for junior W131A warrant officers to demonstrate a basic awareness of culture, how to leverage that knowledge as a BCT/division targeting officer. (See figure 1.5.)

Field Artillery Warrant Officer Basic Course (WOBC) (33 weeks). USAFAS' desired outcome is for senior W131A warrant officers to demonstrate a basic understanding of foreign culture, and how to leverage that knowledge as a Corps/Theater targeting officer. (See figure 1.5.)

Non-Commissioned Officer Academy (4-8 weeks based on military occupational specialty). USAFAS' and NCOA's desired outcome for senior NCOs attending the Senior Leader Course is to demonstrate a basic understanding of foreign culture and how to leverage that knowledge as a platoon sergeant and/or first sergeant. The desired outcome for mid-grade NCOs attending the Advanced Leader Course is to demonstrate a basic understanding of culture and how to leverage that knowledge as a senior section sergeant and/or platoon sergeant. The instruction

Figure 1.5 Cultural Learning Objectives

Learning Objective 1 Character	Learning Objective 2 Presence	Learning Objective 3 Intellect
Field Artillery Captains Career Course: 70 hours		
<p>Assess cultural perspectives and values different from one's own; compare differences and sensitivities in order to modify one's behavior, practices and language, and operate in a multi-cultural environment</p> <ul style="list-style-type: none"> Cross-cultural skills building (4 hours) (P) Cultural influence and military operations (5 hours) (P) International Student Division briefs "Know Your World" (2 hours) (P) <p>Apply cross-cultural communication skills</p> <ul style="list-style-type: none"> Army 360 Cultural Trainer (2 hours – self paced) (R) 	<p>Develop communication skills that enable effective cross-cultural persuasion, negotiation, conflict resolution or influence</p> <ul style="list-style-type: none"> Oklahoma University media training (8 hours) (P) Cross-cultural negotiations (4 hours) (P) <p>Apply communications skills during cross-cultural negotiations</p> <ul style="list-style-type: none"> Role-playing exercises (2 hours) (P) Key leader engagement exercise (1 hour) (P) <p>Develop confidence in learning and applying language skills</p> <ul style="list-style-type: none"> Introduction to a language through Rosetta Stone software (4 hours minimum – self paced) (R) Additional language training (optional) (PD) 	<p>Apply culturally relevant terms, factors, concepts and regional information in the development of mission plans and orders</p> <ul style="list-style-type: none"> Insurgency overview and theory (4 hours) (I) Pattern and social network analysis and practical exercise (8 hours) (I) Counterinsurgency intelligence preparation of the battlefield and planning (6 hours) (I) <p>Assess and describe the effect that culture has on military operations specific to countries or regions of operational significance to the United States</p> <ul style="list-style-type: none"> Strength, weakness, opportunities and threat analysis country brief (6 hours) (P) Writing requirement: Analytical paper of 3-5 pages (Approximately 10 hours of research) (R) Analytical paper presentation/discussion (2 hours per section) (P) FCoE CFLP lecture series (2 hours) (P) Professional reading program (One book from recommended reading list – optional) (PD)
Basic Officer Leader Course B: 53 hours		
<p>Assess cultural perspectives and values different from one's own; compare differences and sensitivities in order to modify one's behavior, practices and language, and operate in a multi-cultural environment</p> <ul style="list-style-type: none"> Operate in a multi-cultural environment (2 hours) (P) International Student Division briefs "Know Your World" (2 hours) (P) <p>Apply cross-cultural communication skills</p> <ul style="list-style-type: none"> Army 360 Cultural Trainer (2 hours – self paced) (R) 	<p>Develop communication skills that enable effective cross-cultural persuasion, negotiation, conflict resolution or influence</p> <ul style="list-style-type: none"> Operate in a multi-cultural environment (2 hours) (P) <p>Apply communications skills during cross-cultural negotiations</p> <ul style="list-style-type: none"> Key leader engagement during BOLC B fire support/maneuver lanes (8 hour) (R) <p>Develop confidence in learning and applying language skills</p> <ul style="list-style-type: none"> Introduction to a language through Rosetta Stone software (4 hours minimum – self paced) (R) Additional language training (optional) (PD) 	<p>Apply culturally relevant terms, factors, concepts and regional information in the development of mission plans and orders</p> <ul style="list-style-type: none"> Information Operations instruction (11 hours) (I) Company Intelligence Support Team training (8 hours) (I) <p>Assess and describe the effect that culture has on military operations specific to countries or regions of operational significance to the United States</p> <ul style="list-style-type: none"> Writing requirement: Analytical paper of 3-5 pages (Approximately 10 hours of research) (R) Analytical paper presentation/discussion (2 hours per section) (P) FCoE CFLP lecture series (2 hours) (P) Professional reading program (One book from recommended reading list – optional) (PD)
Field Artillery Warrant Officer Advance Course: 37 hours		
<p>Assess cultural perspectives and values different from one's own; compare differences and sensitivities in order to modify one's behavior, practices and language, and operate in a multi-cultural environment</p> <ul style="list-style-type: none"> Cultural awareness (3 hours) (P) Cross-cultural factors and considerations (2 hours) (P) Cultural influence and military operations (4 hours) (P) <p>Apply cross-cultural communication skills</p> <ul style="list-style-type: none"> Army 360 Cultural Trainer (2 hours – self paced) (R) 	<p>Develop communication skills that enable effective cross-cultural persuasion, negotiation, conflict resolution or influence</p> <ul style="list-style-type: none"> Cross-cultural factors and considerations during negotiations (2 hours) (P) <p>Apply communications skills during cross-cultural negotiations</p> <ul style="list-style-type: none"> Role-playing exercises (1 hour) (P) 	<p>Apply culturally relevant terms, factors, concepts and regional information in the development of mission plans and orders</p> <ul style="list-style-type: none"> Intelligence preparation of the battlefield and indirect Fires threat intelligence (8 hours) (I) Counterinsurgency seminar (2 hours) (I) <p>Assess and describe the effect that culture has on military operations specific to countries or regions of operational significance to the United States</p> <ul style="list-style-type: none"> Writing requirement: Analytical paper of 3-5 pages (Approximately 10 hours of research) (R) Analytical paper presentation/discussion (2 hours per section) (P) FCoE CFLP lecture series (1 hour) (P) Professional reading program (One book from recommended reading list – optional) (PD)

Learning Objective 1 Character	Learning Objective 2 Presence	Learning Objective 3 Intellect
Field Artillery Warrant Officer Basic Course: 70 hours		
Assess cultural perspectives and values different from one's own; compare differences and sensitivities in order to modify one's behavior, practices and language, and operate in a multi-cultural environment <ul style="list-style-type: none"> Cultural awareness (3 hours) (P) Cross-cultural factors and considerations (4 hours) (P) Cultural influence and military operations (8 hours) (P) Apply cross-cultural communication skills <ul style="list-style-type: none"> Army 360 Cultural Trainer (2 hours – self paced) (R) 	Develop communication skills that enable effective cross-cultural persuasion, negotiation, conflict resolution or influence <ul style="list-style-type: none"> Cross-cultural factors and considerations during negotiations (3 hours) (P) Develop confidence in learning and applying language skills <ul style="list-style-type: none"> Introduction to a language through Rosetta Stone software (4 hours minimum – self paced) (R) Additional language training (optional) (PD) 	Apply culturally relevant terms, factors, concepts and regional information in the development of mission plans and orders <ul style="list-style-type: none"> Intelligence preparation of the battlefield and indirect Fires threat intelligence (8 hours) (I) Pattern analysis and simulation exercise (16 hours) (I) Counterinsurgency seminar (8 hours) (I) Assess and describe the effect that culture has on military operations specific to countries or regions of operational significance to the United States <ul style="list-style-type: none"> Writing requirement: Analytical paper of 3-5 pages (Approximately 10 hours of research) (R) Analytical paper presentation/discussion (2 hours per section) (P) FCoE CFLP lecture series (2 hours) (P) Professional reading program (One book from recommended reading list – optional) (PD)
13B, 13D, 13F, 13M, 13P, 13R, 13T Senior Leader's Course and Advanced Leader's Course: 22.5 hours		
Assess cultural perspectives and values different from one's own; compare differences and sensitivities in order to modify one's behavior, practices and language, and operate in a multi-cultural environment <ul style="list-style-type: none"> Cross-cultural factors and considerations (1.5 hours) (P) Apply cross-cultural communication skills <ul style="list-style-type: none"> Army 360 Cultural Trainer (10 hours – self paced) (R) 	Develop communication skills that enable effective cross-cultural persuasion, negotiation, conflict resolution or influence <ul style="list-style-type: none"> Demonstration on use of tactical language software (Two phrases weekly) (P) 	Assess and describe the effect that culture has on military operations specific to countries or regions of operational significance to the United States <ul style="list-style-type: none"> Writing requirement: Analytical paper of 3-5 pages (Approximately 10 hours of research) (R) FCoE CFLP lecture series (1 hour) (P)
13B, 13D, 13F, 13M, 13P, 13R, 13T Advanced Individual Training: 6.5 hours		
Understand one's self; internalize the Army Values, our professional military ethic and Warrior Ethos <ul style="list-style-type: none"> Army Core Values (1 hour) (P) U.S. Army Field Artillery history and museum tour (3 hours) (R) Command team in-brief (1 hour) (I) Initial, mid-course and final counselling (1.5 hours) (I) 		
Legend: (P) programmed, (R/I) reinforced/integrated, (PD) professional development		

is offered through a blended learning approach which includes programmed instruction, seminars, educational tools and independent study. (See figure 1.5.)

Advanced Individual Training. USAFAS' desired outcome is for 13-series Soldiers in AIT is to internalize the Army Values and Warrior Ethos, live by our professional military ethic and displays empathy towards others. (See figure 1.4.)

For more information. The point of contact for the FCoE Culture and Foreign Language Program and its implementation is Dr. Mahir J. Ibrahimov.

He can be reached at mahir.ibrahimov@us.army.mil or (580) 442-6666, at Fort Sill, Okla.

Dr. Mahir J. Ibrahimov is the Cultural and Foreign Language Advisor at Fort Sill, Okla. He completed his Ph.D. at the Academy of Social Sciences in Moscow in 1991 and has attended several post graduate programs at Johns Hopkins University, and other U.S. institutions. He also served in the Soviet Army and witnessed the break-up of the Soviet Union. As a former high-ranking diplomat, he

helped open the first embassy of Azerbaijan in Washington, D.C. While working for the U.S. Department of State, he instructed U.S. diplomats in languages and cultures. He also provided vital assistance as a multi-lingual cultural adviser to U.S. forces during Operation Iraqi Freedom II and became the subject of a Department of Defense newsreel, "Jack of All Languages." Dr. Ibrahimov specializes in the cultural issues of the former Soviet Republics, south-central Asia and the Middle East. He is the author of "Invitation to Rain: a Story of the Road Taken Toward Freedom," and numerous other publications.

Bouncing Back:

How are we building resilient Soldiers and units?

Soldiers and airmen from Provincial Reconstruction Team Zabul return to base after a quality assurance, quality control patrol near the city of Qalat, Zabul province, Afghanistan, Nov. 1, 2010. (Photo by SSgt Brian Ferguson, U.S. Air Force)

By COL (Ret) Joyce DiMarco and
LTC (Ret) Richard McConnell

In “The Resilience Factor” Karen Reivich and Andrew Shatt’e write, “Resilient people like all of us, feel anxious and have doubts, but they have learned how to stop their anxiety and doubts from overwhelming them. We watch them handle threat with integrity and grace and we wonder: Could I do that?”

The ability to overcome adversity and excel is a virtue all of us prize. However, some are more successful than others. Wouldn’t it be wonderful if we could replicate and bottle that skill for others and ourselves? As our Army struggles with an unprecedented suicide rate, we do well to focus on how to improve our ability to ‘handle threat with integrity and grace.’ However, is focusing solely on individual resilience enough?

The Command and General Staff College has incorporated “resilience” as a key portion of its core curriculum. The foundation of this idea is leaders who are more resilient will better lead subordinates through the myriad of challenges our current fight presents. According to the United States Army Combined Arms Center’s 2010 Foundations Student Issue Advance Book, the enabling learning objective states the resilience lesson outcome as, “describe a leader’s role in building resilience in Soldiers and organizations.” So, why is resilience so important to our Army today?

American Soldiers of the 21st century are quietly making history, serving in combat longer than almost any U.S. Soldiers in the nation’s past, military historians say. There are currently 309,670 active-duty enlisted Soldiers who have served combat tours. Percentage of deployments. (See Figure 1: Percentage of deployments.)

Army combat tours. As the above quote and graphic indicates, building resilience into Soldiers, despite their current deployment rotations, is essential. It is no surprise that resilience training is a significant effort within the Command and General Staff College. Resilience training is focusing on building toughness and the ability to bounce back from adversity – not just physical but mental and emotional toughness. In light of the current tempo of deployments, paired with the personal and professional challenges they bring, it is vital we focus on the ‘total Soldier;’ but is that enough? Once we acknowledge the need for individual resilience, we should then focus on translating that same toughness to the groups of which they are a part. It is not enough to build toughness into the individual person

without then applying that toughness to making the group or unit better prepared to fight and win.

The purpose of this article is to describe key resilience concepts. We will discuss how to apply these resilience concepts to individuals and then investigate potential ways leaders might apply them collectively in order to build units that are more resilient.

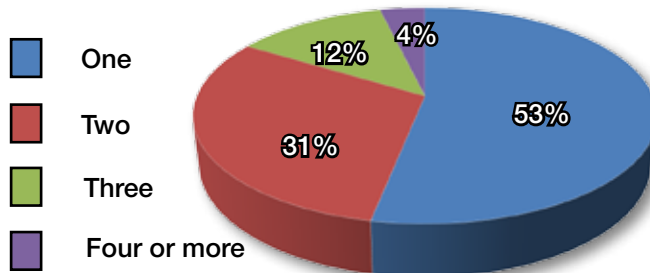
Here are five key concepts of resilience and how they apply to individuals as well as units: activating events, thoughts and consequences, disputing beliefs, detecting icebergs, avoiding catastrophizing and emotional intelligence.

Activating events, thoughts, and consequences. “The bad news is that having a pessimistic explanatory style can have a big negative impact on your life. The good news is that you can change your explanatory style for better,” according to Brett and Kate McKay’s article, “Building Your Resiliency: Part 1, An Introduction.”

Most people’s explanatory style of any given adversity can greatly affect what they believe about themselves in relation to the world around them and ultimately the outcome of that adversity. Have you ever known someone who seemed unfazed by adversity? The moment they encounter adversity, they immediately determine a way to overcome it. What makes them so capable of bouncing back?

Case study. MAJ Smith has been the assistant S3, operations officer at the brigade S3 shop for six months. He has been working on a key staff action for a week when LTC Jones (the brigade S3) calls him into his office. Jones informs him he has reviewed Smith’s draft plan and has ‘big’ changes. Smith perceives his boss is not angry but irritated. Smith and

Figure 1: Percentage of deployments (Source: USA Today, Jan. 12, 2010)



Jones have some choices on how they respond to this adversity – the question is which choice will help them effectively manage their activating events, thoughts, and consequence connections in such a way that will build resilience?

Choice 1. MAJ Smith can feel this event activating definite emotions and he gets a ‘sinking’ feeling in the pit of his stomach. He thinks, “Man, I clearly messed this up!” He can tell the boss is not happy and already he considers all the negative consequences that could result from this encounter. He feels discouraged at the possibility of redoing his work and is not sure he can hit the mark even if he does redo the action. LTC Jones notes that Smith is getting a little defensive and his thoughts turn to negative consequences as well. The lieutenant colonel’s irritability starts to turn to anger and he is thinking, “Smith just doesn’t get it,” and, “I do not have time for an attitude problem on this.” The meeting ends abruptly and Smith returns to his desk wondering how he can get out of the pit he has gotten himself into. (See Figure 2: Activating events.) If this becomes a cycle, this could continue to undermine resilience in Smith and will definitely damage their working relationship.

Choice 2. MAJ Smith can feel this event activating definite emotions and he gets a ‘sinking’ feeling in the pit of his stomach. He thinks, “Man, I clearly messed this up!” He can tell the boss is not happy and already he considers all the negative consequences that could result from this encounter. He feels discouraged at the possibility of redoing his work and is not sure he can hit the mark even if he does redo the action. Smith then realizes he has done this to himself before. He knows from experience that sometimes he can blow situations like this out of proportion in his own mind. He decides to determine how much trouble he is in. “Sir, sorry I missed the boat on this – hope this has not damaged your confidence in me.” Jones realizes he may have been a little harsh and decides he has gotten his point across, “Jeff, you still have my confidence. Let’s just get this fixed as soon as possible.” The meeting ends with LTC Jones giving clear guidance and a plan of action on how to make up the lost time and meet the commander’s intent. Smith returns to his desk relieved he has not totally shot himself in the foot and redoubles his efforts to meet the commander’s intent. (See Figure 3: Activating events.)

What are the key differences in these two choices?

Smith’s choices. If Smith’s experiences have led him to believe he has a bad track record in completing tasks or if this is his third ‘talking to’ since he started at the S3 shop he might go for the first choice. If he makes similar choices repeatedly, Smith may encounter more situations that may make it hard for him to deal with adversity. If Smith’s experiences lead him to believe he can handle most problems thrown at him, he is more likely to believe the adversities he faces will ultimately result in a positive consequence, or choice two. In choice two, when confronted by Jones’ displeasure that he had missed the mark, Smith tests the water to see if he can recover from this mistake. Fortunately, Jones

confirms all is not lost and they can recover from this. If Smith then recovers from this problem successfully, this whole incident may result in improving his ability to bounce back from adversity resulting in improved resilience.

LTC Jones’ choices. If Jones has had a history of having to refocus Smith on more than one occasion he may be more likely to respond with irritability, at ‘yet another occasion to correct Smith.’ However, with choice two, acknowledging that Smith has not lost his confidence and then giving constructive guidance and helping to build a plan of action in order to fix problems builds resilience. The key to making choice two, a resilience-building situation, over choice one, is being sensitive to the activating events, thoughts, and consequence connections as they begin to emerge. Smith realized that the adversity, or activating event, he was facing was taking him to a place mentally he did not want to go (thoughts that he cannot win resulting in becoming discouraged), and decided to do something about it. Jones realized that Smith had gotten the message and rather than continue that message decided to communicate he still believed Smith could get it right and provided guidance and a plan of action. In order to get a resilience-building outcome, both parties had to pay attention to the thoughts they were having and find a way to challenge them.

So far, we have discussed how activating events, thoughts and consequences or ATCs affect individuals; however, how do ATCs impact groups/units and what can be done to build units that are more resilient?

Increased adversity. Three months after the above encounter, Smith and Jones have deployed to Afghanistan with the rest of the brigade staff. The chances of more adversity, both individually and collectively, have increased. Staff members in the S3 shop are aware that Smith has missed the mark in the past and been corrected by LTC Jones. It is the third week of operations, and Smith gets a second redo on a staff action, resulting in other subordinate staff members affected. The number of individuals involved now multiplies the choices.

Here are a few potentially non-resilient options:

- **Subordinate staff member:** “If Smith does not get it together we are in for a rough deployment.”
- **Smith:** “Man the boss is just riding me. How can I get off his list?”
- **Jones:** “We really do not have time for this right now. At this rate, we are not going to get much sleep.” (See Figure 4 on page 32, Activating Events).

As a result, the number of people who have them can now multiply all of these negative consequences. If allowed to persist, this attitude can cause problems that can take on lives of their own where all adversity reinforces bad belief/consequence linkages. However, we do not have to choose the above ATC linkages – how about a more resilient option?

• **Operations SGM Brown:** “I have served with LTC Jones previously and know what he is looking for in this action. I am going to take this young major aside and get him squared away.”

Figure 2: Activating events

Activating event: (Failed staff action)	+	Thoughts (MAJ Smith): “I can’t win.”	=	Discouragement
Activating event: (Failed staff action)	+	Thoughts (LTC Jones): “He doesn’t get it.”	=	Anger

Figure 3: Activating events

Activating event: (Failed staff action)	+	Thoughts (MAJ Smith): Perhaps I can fix this.”	=	Determination
Activating event: (Failed staff action)	+	Thoughts (LTC Jones): “I think he got the message.”	=	Reassurance

Figure 4: Activating events

Activating event: (Failed staff action redo)	+	Thoughts (Staff): "This is a bad trend."	=	Resignation
Activating event: (Failed staff action redo)	+	Thoughts (MAJ Smith): "I cannot win."	=	Discouragement
Activating event: (Failed staff action redo)	+	Thoughts (LTC Jones): "He just doesn't get it."	=	Anger/resignation

Figure 5: Activating events

Activating event: (Failed staff action redo)	+	Thoughts (Staff): "We can help MAJ Smith."	=	Determination
Activating event: (Failed staff action redo)	+	Thoughts (MAJ Smith): "I can do this."	=	Determination
Activating event: (Failed staff action redo)	+	Thoughts (LTC Jones): "I'll try a different approach."	=	Determination

• **Smith:** "Okay, I have been here before and have been able to answer the mail. Let me get the staff together to make sure we get this iteration right – maybe I am missing something."

• **Jones:** "I am going to get SGM Brown to help us out on this. Maybe he can help me be clearer in my guidance and help Smith to grasp the big picture." (See Figure 5, Activating Events).

What are the key differences in these approaches? It is vital to see how we, as individuals, connect adversities or activating events with thoughts we form. Individuals and groups can develop a pessimistic explanatory style that can poison their resilience. This explanatory style can result in groups who cannot imagine what success looks like and thus they are likely to continue to struggle. In other words, if they always expect the worst they will often meet their expectations. This is why effective management of ATC connections is important. It is one thing to be someone who has been convinced by adversity to believe in bad outcomes – it is an entirely different matter when an entire group (or unit) collectively expects bad outcomes. It is the responsibility of leaders to first manage their own ATCs and then create an environment where Soldiers can manage theirs. Once we have resilient Soldiers, we have a foundation for building resilient units, who able to bounce back from any adversity they face. How do we do this? When we have an activating event, we should pay attention to our thoughts and find a way to challenge them. This is the resilience concept of disputing your beliefs.

In their work, "Building Your Resiliency," the McKays further explain, "Just because you have certain beliefs, even if you have held them for as long as you can remember, that does not make them true. If you have some beliefs that are sabotaging your resiliency, you need to dispute them, challenge them and have an argument with yourself."

Disputing your beliefs. As the above quote implies, individual beliefs can defeat resilience. What can we do to prevent this? Dr. Martin Seligman, in his book, "Learned Optimism, How to Change Your Mind and Your Life," recommends using four filters in order to dispute potentially destructive beliefs. He recommends viewing these beliefs through the filters of evidence, alternatives, implications, and usefulness. How do we do this?

Reviewing the situation with Smith during the ATC discussion, his thoughts connect to beliefs he holds regarding himself. The big turning point between a resilience-defeating and resilience-building option is when he challenges his belief. The key moment occurred when he realized in the past he has blown situations like this out of proportion. He decided to test his belief. How did he arrive at that approach?

Filter 1, evidence: "Jones is saying this current product is not correct. He does seem frustrated but we have had a good relationship up until now, could there be another reason for his frustration?"

Filter 2, alternatives: "Jones has really been under the gun to

finish a special project for the brigade commander and I know he has a deadline looming. Perhaps this stress is causing some of his frustration, not just this current discussion."

Filter 3, implications: "Jones and I have been able to work well together before; perhaps the boss has not lost all confidence in me."

Filter 4, usefulness: "Jones actually gave me pretty specific guidance on this project and I followed it. How can he be mad now?" Smith decides this thought is not useful in solving the current problem so discards it in favor of a statement designed to elicit LTC Jones' perception.

The key to the above steps was discarding the most pessimistic interpretation of events in favor of a perhaps more reasonable, less pessimistic interpretation. Smith, at once, arrives at a more resilience-building option while at the same time not becoming unreasonably optimistic or 'head in the clouds.' If Smith can dispute his beliefs effectively as an individual, how can these concepts help the group or unit?

As stated earlier, when a group becomes involved, the chance for many interpretations of events becomes a challenge. However, leaders can make a huge difference. In this case, Operations SGM Brown does so by injecting some very practical solutions. How did he arrive at that approach?

Filter 1, evidence: "Jones is saying this current product is not correct. I have seen this before. There is always a process getting a new staff officer on the same page as the boss."

Filter 2, alternatives: "Afghanistan is a stressful place and I know the boss is low on sleep. I saw this before when we worked together at battalion level. Lack of sleep makes for more friction."

Filter 3, implications: "This is not the end of the world, misunderstandings happen especially when people are tired. Both of these officers are going to get there. We just need to work harder on communication."

Filter 4, usefulness: "Jones actually did give the MAJ some confusing guidance on this project which the major followed, but it's not useful to bring that up. Let's focus on fixing this and not poking the tired bear."

Leaders can choose to select resilience-building or destroying options when dealing with adversity. When disputing beliefs, the individual and group can decide to 'have an argument' with their interpretation of events, which can result in a more resilient individual and group. Why is this so hard to accomplish? Because much of resilience has to do with what people are thinking inside and perhaps not stating.

So far, we have discussed managing ATCs and disputing beliefs. What can we do if we have beliefs that focus on the worst of a given situation? The more we think about the situation, the more we feel trapped into believing the worst outcome. This is called "catastrophizing."

Avoiding catastrophizing. People can fall into thinking traps by focusing on the worst-case interpretation of their circumstances. When the worst-case interpretation continues to deteriorate because the person dwells on it, serious detrimental effects to resiliency can result. In their article, “Building Your Resiliency,” the McKays call this thinking-trap catastrophizing. Catastrophizing can stand in the way of a resilient response to adversity. Military units can fall into similar collective thinking traps that can stand in the way of dealing effectively with adversity as a group.

Smith’s situation is one that can easily lead to catastrophizing. When Jones counseled Smith about failing to meet his standard on the staff action, Smith could start catastrophizing by engaging in an inner dialog that could look like this: “Man, I clearly messed this up! This is not the first time this has happened – the boss has truly lost confidence in me. This is going to really mess up my officer evaluation report and I am not going to be promoted to the next higher rank. I am going to have to get out of the Army and find other employment. I am going to have to learn to sell shoes at the discount shoe store in the rough section of town. I will not be able to make the house payment, I will lose the house and my wife will leave me.”

Clearly, this thinking only gets worse with further reflection and without some way to reverse the trend; Smith’s resilience will be adversely affected. How can we combat catastrophizing?

Get some perspective. In the same article by the McKays, combating catastrophizing is a process of “putting it in perspective.” In Smith’s situation, a way to combat catastrophizing would be something like this:

Worst case: already accomplished by catastrophizing: “Man, I clearly messed this up! This is not the first time this has happened – the boss has truly lost confidence in me...etc.”

Best case: “I will not only fix the staff action but will exceed the

standard. Jones will be impressed by my inspired solution. I will receive an incredible OER resulting in selection below the zone. I will conclude my career as Chief of Staff of the Army.”

Most likely: “I will fix the staff action. Jones will realize I screwed this one up but that I fixed it. Life will continue as before only now I have learned what not to do next time.”

Once Smith has completed this inner dialog, he has successfully seen his left and right limits. He can realize if the best case is not likely to happen, then the worst case is equally not likely. Smith is now able to determine the most likely option and make plans for dealing with it. In this way, he is able to put his catastrophizing ‘in perspective’ and escape this thinking trap in favor of a more resilient response. So how can catastrophizing affect an entire group?

Again, once a group becomes involved, the chance for many interpretations becomes a challenge. However, leaders can make a significant impact in preventing both individuals and groups from catastrophizing. In the case of Smith struggling with meeting Jones’ guidance in Afghanistan, the possibilities for catastrophizing are significant.

Here is a way it could look. “If Smith does not get it together we are in for a rough deployment. I saw this last deployment down range, where we had multiple re-dos and people were down to three hours of sleep a night. This is how horrible accidents occur – I could see someone hit by a truck or worse because of people not getting enough rest. I could see us getting a lot of people killed at this rate.”

It does not take much for this thinking to spiral down to the most pessimistic interpretation possible with the potential of adversely affecting unit morale. The difference between the unit’s situation and Smith’s inner dialog is more than one person on the staff might be sharing some or all elements of this catastrophic style of thinking. It is up to leaders working diligently to change this narrative in the

SGT James Small (right) helps SPC Andreas Plaza up a mountainside in the Towr Gahr Pass, Nangarhar province, Afghanistan, Nov. 6, 2010. The Soldiers climbed up and down a 4,000-foot mountain to visit the town of Gurem for the first time. (Photo by SSG Ryan C. Matson, U.S. Army)





SGT James Hatcher (right) leads a column to the village of Kautiak, Afghanistan, Oct. 30, 2010. The Nuristan Provincial Reconstruction Team often visits local villagers to see how their government is helping them improve their lives after more than three decades of war. (Photo by CMSgt Richard Simonsen, U.S. Air Force)

minds of their Soldiers. How can we do this?

According to the 2006 *Field Manual 6-22, Army Leadership, Competent, Confident, and Agile*, “Emotionally balanced leaders are able to display the right emotion for a given situation and can read others’ emotional state. They draw on their experience and provide their subordinates the proper perspective on unfolding events. Balanced leaders know how to convey that things are urgent without throwing the entire organization into chaos. They are able to encourage their people to continue the mission, even in the toughest of moments.”

The above quote shows the balanced leader can “read others’ emotional state” and “provide their subordinates the proper perspective on unfolding events.” It is clear that leaders putting things in perspective for units is not a new leadership concept. Therefore, it is up to the leaders to address the non-resilient or overly pessimistic interpretation of events their Soldiers may hold. This is done by addressing them much like Smith, setting the left and right limits then focusing on what is the most likely outcome. How would this look?

Worst case: already done by catastrophizing but now tempered for the group, “We have had some challenges getting our staff work up to snuff and meeting our standard and some of us are worried that we are in for a rough deployment. This is not our first dance and many of us have seen this before in previous deployments where multiple re-dos on staff work caused lack of sleep. I am also

concerned about this because I know that lack of sleep does create an increased risk environment where accidents can happen. Some of you may be thinking that not getting staff actions right might affect units in combat where mistakes can have tragic results.”

Best case: “But we are better than that – in fact the best case outcome may be, we will not only fix the staff action challenges but will exceed the standard. We will do so well, that all of us will get eight hours of sleep a night. Not only will we not have any accidents but we will be recognized by the chief of staff of the Army as best deployed unit of the year. We will do so well that the president will meet our plane to recognize us when we redeploy.”

Most likely: “Ok, perhaps I got carried away. So here is what is most likely to occur, we will fix our challenges. We will make sure that all staff members have a shared understanding of how we fixed our challenges. The deployment will continue as before only now we have learned and improved as a unit.”

Perhaps part of the above example seems farcical; however, it is still important for leaders to “read others’ emotional state,” and “provide their subordinates the proper perspective on unfolding events.” Setting left and right limits in this way, in order to focus either individuals or groups on most likely outcomes, can result in responses to adversity which are more resilient both individually and collectively.

We have discussed managing ATCs and disputing beliefs, among those beliefs catastrophizing is particularly damaging to resilience. However, these are all beliefs of which we are aware. What do we do if we have beliefs that cause us to have extreme responses to situations that we do not understand? It is as if our emotional response is worsened by a belief that is not readily apparent or seems below the surface. These are called “iceberg beliefs.”

Detecting icebergs. At times, we encounter a brand of adversity which gets us more emotionally invested than we might believe is appropriate. Someone makes a comment to us, which at face value could have been intended as innocent, but touched a nerve and we become angry. In these situations, there is likely some underlying belief that makes us interpret this comment in such an emotional manner. These are icebergs because they are more than they appear on the surface. Individuals in a group of people can have similar beliefs causing overly emotional reactions, which then affect the whole group.

Let us apply this concept to Smith’s situation on the staff action gone wrong in garrison. He arrives home after a frustrating day attempting to fix the staff action. He is home late, after the kids have gone to bed. His wife Peg activates his iceberg belief when she asks, “Why are you home so late?” Before he can realize how angry he is, Smith blows up at Peg and starts yelling, “Why do you always have to know when I work late? I am focused on work sometimes and I am working my tail off so I can provide for the family.” If Smith can calm down and review why his reaction was so extreme, he could ask himself a series of questions. In their book, “The Resilience Factor,” PhDs Karen Reivich and Andrew Shatte recommend asking a series of “what” questions in order to identify iceberg beliefs. Questions such as, what does that mean to me? What is the most upsetting part of that for me? What is the worst part of that for me? What does that say about me? What’s so bad about that?

If Smith were to ‘engage in an argument with himself’ over this, perhaps it would look something like this:

• **Question:** “Peg asked me why I was so late, what is so bad about that?” Answer: “I am a grown man working my tail off to provide for this family, I do not need her second guessing me every time I have to work late.”

• **Question:** “What is so upsetting about her second guessing me?”

Answer: "I feel like it means she does not think I am in control of what is happening at work and thus the effect it can have on her and the kids."

- **Question:** "What is so bad about her thinking that you are not in control at work?"

- **Answer:** "I feel like she is insinuating that I cannot manage my professional life and be a good dad and husband."

- **Question:** "Why is that so upsetting to you? Answer: "Because my dad struggled to hold down a job all of his life and was a bad provider which caused problems resulting in my parents' divorce – I am nothing like him!"

Once Smith understand his reaction, he can start to acknowledge Peg's question was innocent and not full of a meaning he applied. This process can readily apply to a group when this particular scenario is repeated in the Smith household multiple times. Perhaps Peg could develop her own iceberg belief, such as a deep-seated fear that her husband is missing important events in their children's lives. Peg's inner dialog may contribute to this iceberg something like this: "If he is this disconnected from the family now, how distant will he be after this next deployment? I did not get married to become a single parent but the Army is making me one." If she shares some of these fears with friends in the family readiness group, such iceberg beliefs may become replicated across the brigade. Can this really happen? Absolutely! What can a leader do about this replication?

The first step is becoming aware of the concepts we have discussed so far. The second step is learning how to recognize them in our own units and take steps to correct these problems before they spread to other individuals and affect the entire unit. In order to accomplish this, leaders must be able to gain situational understanding not only of their own feelings but also of those around them. This understanding is called "emotional intelligence" or, "emotional quotient."

Emotional intelligence.

One analogy of the organizational leader's ability to understand how team members are feeling and build resilience successfully dealing with more activating events, or stress, is the kitchen sink. (See Figure 6: Stress and the kitchen sink.) Your sink has a finite amount of space. It has a plug to release water, representing stress, and a faucet that can add more water to the sink. It also can receive water from an outside source such as a pitcher or bucket. Everyone and every unit have a different size sink. The sink can only hold so much water before it overflows at any given time. The leader of the organization must monitor the water level in the organizational sink. It is within the leader's ability to control how much water he adds to the sink by turning on the faucet. It is the leader's responsibility to watch and determine when it is time to

pull the plug and let some of the water out. There may be some unseen issues such as a clogged garbage disposal. The outside influence maybe a higher headquarters or a strategic level decision that is adding pitchers full of water into the sink that is beyond the leader's ability to control. The leader then needs to do something that is very difficult to do in the context of our Army culture. He has to prioritize and let some things go down the drain to make room for the added stressors, which he cannot control. This requires development of EQ, both personal and organizational, and the ability to have perspective.

Because everything in the Army seems to be a priority, leaders get where they are by 'doing it all.' Good organizational leaders recognize making everything a number one priority is neither logical nor possible. If a leader has a good emotional quotient, he knows when to pull the plug on some of lower priority tasks, ensuring that the sink does not overflow. In addition, the commander controls the communication of his vision for the organization. His example leads his organization, through avoiding thinking traps, disputing beliefs, detecting icebergs and avoiding catastrophizing. It is important that leaders recognize and deal with activating events and not ignore them. They may resurface in a negative or destructive way somewhere down the road. Units should deal with grief, heal from past activating events, develop emotional intelligence and gain broader perspective just as individuals do. Resilient leaders will take the long view, not merely the two-year command they may be in, and think about the organization's long-term health. Resilient leaders prioritize their resources, particularly time and personnel, in a way that allows these resilience-building processes to occur.

For the organization with the full sink, the same tools mentioned earlier for the individual can apply to building resilience for the unit. The self-talk technique of Smith can occur in several ways, as

Figure 6: Stress and the kitchen sink. The water in the left sink represents too little stress. The water in the right, full sink represents too much stress. Leaders must monitor the water level (stress level) in their sink (organization).

(Photo illustration by Jennifer McFadden, Fires Managing Editor)





SPC David Reaves provides security alongside an Afghan National Army soldier at an ANA compound in Parwa'i village in eastern Afghanistan's Nuristan province, Aug. 26, 2010. (Photo by SSgt Steven R. Doty, U.S. Air Force)

leaders communicate building member buy-in to a positive command vision. Verbalizing a vision of an improved future for the unit is a good start. It is imperative that the leader has an organizational message that represents his vision and conveys hope for the members of the organization. Organizational vision can be communicated in several ways: verbal, written or by example. An explanation of why the organization is in a particular stressful environment often goes a long way to earning buy-in and building the ability to bounce back.

In the book, "Emotional Intelligence," Daniel Goleman, describes why it can matter more than IQ. He says emotional intelligence is the "capacity for recognizing our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and our relationships." This knowledge can result in giving others and ourselves an opportunity to relieve some of the pressure, like letting water out of the kitchen sink, caused by adversity rather than having an emotional response. Once we know we have beliefs that can sink us because of obstacles below the surface, like the icebergs we discussed,

we can realize we can give others and ourselves 'a little slack.'

Organizations share many of the characteristics of individuals in terms of the effects of stress and mitigating those effects. Like individuals, organizations can give themselves 'a little slack.' Organizational self-awareness can result in an organization that is able to recover from a stressful activating event or relentless stressful environment.

After action reviews, and in progress reviews are good opportunities for a unit to develop emotional intelligence. This development can result in an organization that is as resilient as the individuals it contains. Organizational self-talk in these forums is the equivalent of disputing beliefs, as accomplished by Smith and Jones in our example.

Leaders can also use these tools to provide an alternate narrative to FRGs as in the iceberg example in the Smith home spreading to the FRG. The leader tools available are similar for both the individual and the organization.

"Our Soldiers and units deal constantly with the tyranny of operational tempo that sets high demands. Never before has the need for mental toughness been more essential, in order to sustain the current fight for the long term."

Creating hardiness. In Paul T. Bartone's article, "Resilience Under Military Operational Stress: Can Leaders Influence Hardiness?" he touches on leader's influence, or what he calls "hardiness," and makes the case for a "hardy leader influence process." Army leaders' visions include the leader's role in building a more resilient organization. The Army's efforts to develop a Master Resilience Training Program is one way to provide commanders in the field a tool to develop a unit's ability to bounce back. Master Resilience Trainers must undergo a ten-day program on the use of resilience practices and their application to units. Ultimately, each battalion-sized element will have their own MRT. According to the MRT Skills Teaching Overview, these senior NCO's are learning how to assist other unit leaders in the tasks of building mental toughness. This training includes ATC, avoiding thinking traps, detecting icebergs, and keeping perspective. In short, these MRTs will be able to show commanders how to shut down counterproductive thinking, enabling greater concentration and focus on the immediate task with resilience techniques.

Why is resilience so important to us in today's Army? Our Army is 'quietly making history' deploying more often with less Soldiers than ever before in our history. Our Soldiers and units deal constantly with the tyranny of operational tempo that sets high demands. Never before has the need for mental toughness been more essential, in order to sustain the current fight for the long term. Although we should all be watchful of fellow Soldiers who are struggling, leaders at all levels are key to this effort. In the end, leaders and especially commanders, affect the resilience of an organization. They influence the organization's overall resilience, one Soldier at a time, as well as entire groups at once. Like all military operations, this is a team effort. We as an Army

should encourage all Soldiers to learn and practice these resilience techniques and then leaders should take the next step by applying them to the entire unit. Building individual and unit resilience is the key to how we build tougher Soldiers and Units. This is how we can learn to bounce back from adversity stronger than we started.

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Avenger gunnery strikes deep



Echo Battery, 5th Battalion, 52nd Air Defense Artillery's Avenger gunnery crew successfully completed Table VIII certification of all battery crews at Orogrande Range, Fort Bliss, Texas, Oct. 18-21, 2010. Avenger crews with the highest test scores and Table VIII performance attempted Table X certification, which included engaging a drone plane with a Stinger missile. (Photo courtesy of 1LT Christopher Rossi, U.S. Army)

MILLENNIALS AND TRANSFORMATIONAL LEADERS: A WINNING TEAM FOR THE FUTURE — PART II OF II

By COL James E. Lackey, Professor Gene Kamena and COL Paul Calvert

TRANSACTIONAL CONVERSATION: COL BROWN TOLD CPT JONES THAT IN ORDER TO RECEIVE A 'TOP BLOCK' FOR PROMOTION HE WOULD HAVE TO HAVE EVERYONE QUALIFY FIRST TIME ON THE RIFLE RANGE.

TRANSFORMATIONAL CONVERSATION: COL BROWN ENCOURAGED CPT BROWN TO STRIVE FOR A 100 PERCENT FIRST TIME 'GO'S' FOR HIS COMPANY ON THE RANGE. COL BROWN TOLD JONES THAT HE KNEW HE COULD DO IT; HE HAD THE TALENT AND LEADERSHIP TO SET A NEW RECORD. THE COLONEL ALSO TOLD THE CAPTAIN THAT HE WAS A TALENTED OFFICER AND THAT HE APPRECIATED HIS HARD WORK AND UNIQUE SKILLS.

Transformational approach with Millennials. Dr. Carolyn Martin and Bruce Tulgan have conducted extensive research and workplace interviews with Millennials. A product of their work is identification of expectations Millennials have for how they want to be led. Some of the key expectations are: Provide challenging work that really matters; balance clearly delegated assignments with freedom and flexibility; offer increasing responsibility as a reward for accomplishments; spend time getting to know staff members and their capabilities; establish mentoring relationships; balance the roles of 'boss' and 'team player;' and consistently provide constructive feedback.

These expectations coupled with the four components of transformational leadership and the knowledge of Millennials established earlier in the paper will serve as the framework for assessing whether a transformational leadership approach would be effective in leading Millennials to achieve organizational success.

Transactional leadership. Bass and Riggio state that transactional leadership occurs when the leader rewards or disciplines the follower, depending on

the adequacy of the follower's performance. Transactional leadership depends on contingent reinforcement, either positive contingent reward or the more negative active or passive forms of management-by-exception. Millennials will not respond well to threats or negative forms of leadership. They want to be led and inspired; they already have the desire to excel.

Leadership style caveat. Leadership in the military will never be an absolute choice of transformational or transactional style. Circumstances, personality of individuals involved and group dynamics must all be considered. The reality is leadership may evolve to a hybrid style to meet circumstances. There is a time and place for both transactional and transformational leadership.

Challenging work that matters. Millennials are achievement oriented and capable of handling multiple tasks simultaneously. They have a self-perception of being special based on being raised in a protected environment and seek to contribute to an organizations success. A transformational leader using inspirational motivation will meet this expectation by providing clear task and purpose for

missions to be executed ensuring purpose is linked to long term goals and objectives that support a stated vision. Using intellectual stimulation, the transformational leader encourages creativity and innovative problem solving when assigning missions and takes into consideration that Millennials are inexperienced and mistakes are going to be made. Underwriting honest mistakes allow for Millennials to grow and encourages future initiative.

Balance delegated assignments with freedom and flexibility. Raised in structured environments, Millennials are accustomed to being told what to do, but not necessarily how to do it. Applying the components of intellectual stimulation and individualized consideration provides structure for accomplishing tasks while simultaneously allowing for initiative. The transformational leader who uses these components defines the tasks, provides left and right limits for execution and allows for freedom of action to accomplish the mission. In-progress reviews become important for the leader, as well as the inexperienced Millennials, to ensure task completion remains on track and serves as a means to provide additional guidance if required.

Offer increasing responsibility as a reward for accomplishments. This expectation of leaders speaks directly to the confidence Millennials have in themselves, as well as their peers, and desire for ever increasing responsibility. At face value, this is an exchange of reward for doing something good. But a transformational leader who uses individualized consideration balances the Millennials desire for increased responsibility as a result of achievement with their current experience and potential.

This is accomplished through mentorship and providing feedback to the Millennials ensuring not to give more responsibility than is capable of being handled.

Know your team. Millennials are team oriented by virtue of playing team sports growing up and being connected 24/7 to a network of people. They understand the power of many is greater than that of an individual. Fulfilling this expectation affords a transformational leader the ability to employ all four components of transformational leadership. Engaging at the individual and organizational level – transformational leaders set the example and provide insight to common values that are shared. They communicate expectations and goals, foster a sense of team, address problems and gain a greater sense of the abilities held by individuals and units through personal engagement. This provides insight that enables the transformational leader to better understand his people and organization.

Mentor your Millennials. Millennials have been mentored their entire lives. Raised by engaged parents, Millennials rely on mentorship from older adults and seek development by those who lead them. Establishing a mentoring relationship allows a transformational leader to use all four components of transformational leadership. Serving as a role model, demonstrating competence and building trust and respect are keys to influencing during a mentoring relationship.

As the transformational leader gains credibility as a mentor, he inspires the Millennial he is mentoring to become a mentor, too. As an effective mentor, the transformational leader stimulates the intellect of those he mentors and challenges them to higher levels of potential.

Balance the roles of ‘boss’ and ‘team player.’ With a strong desire to be led and having grown up with an ever present authoritarian figure, Millennials seek a leader who demonstrates he is, “unafraid to get into the trenches with everyone else,” according to Bass and Riggio’s *Transformational Leadership*. Setting the example through demonstrated competence in worker core skills enables a transformational leader to connect with Millennials through the component of idealized influence. This in turn serves as motivation to the Millennial allowing the transformational leader to strengthen communication and further evoke a team oriented approach through the component of inspirational motivation.

Constantly provide constructive feedback. Teachers, coaches, peers and parents have routinely provided Millennials with feedback on how they are doing. Expectedly, Millennials look for and seek performance feedback. Applying all four components of transformational leadership allows a leader to provide feedback for self-improvement during counseling and mentoring sessions, stimulate thought in Millennials to try

new techniques for accomplishing tasks in relationship to organizational goals and objectives, and sets a positive example for development of young Millennial leaders.


The Millennials’ expectations for being led are a product of how they have been raised and the traits and characteristics which define them. It is evident when the components of transformational leadership are applied against the Millennials’ expectations that a leader can inspire and influence individuals by providing purpose, direction and motivation resulting in organizational success, according to *FM 6-22 Army Leadership: Competent, Confident and Agile*.

While this determination is somewhat sterile, an example is provided. A battalion deployed in support of OIF with greater than 50 percent of its Soldiers from the Millennial Generation. Often, battalions are detached from its organic headquarters, and in this case 12 of the 15 months this unit was deployed it worked for four different brigade headquarters. Using a transformational leadership approach, the battalion leadership established a vision for organizational success and communicated it to the subordinate units routinely. The subordinate units and Soldiers bought into the vision and took ownership of it. Application of the four components of transformational leadership was the norm from the lowest to the highest levels of leadership. Moral soared in the unit. They accomplished more than they ever thought

“Millennials are team oriented by virtue of playing team sports growing up and being connected 24/7 to a network of people. They understand the power of many is greater than that of an individual.”



Photo by SPC David A. Jackson, U.S. Army

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- **Recognize that organizational success is a product of the combined efforts of the leader and the led.**
 - **Do not underestimate the importance of a Millennial's relationship with their parents.**
 - **Establish a comprehensive leader development program across the entire organization.**
 - **Foster an environment where leaders are engaged with subordinates.**
 - **Allow for collaboration and independent learning.**
 - **The Department of Defense should facilitate a Millennial study and then hold a Millennial conference to announce and discuss the results of the study.**
 - **Relook rewards and encourage competition for military members.**

Authors' recommendations for Millennial leadership. (Photo by SGT Charles Espie, U.S. Army.)

possible and achieved a high level of organizational success. Transformational leadership of Millennials can be an effective approach to achieving organizational success.

Recommendations. Considering Millennial characteristics and the transformational style of leadership, the following recommendations are offered for consideration.

RECOGNIZE THAT ORGANIZATIONAL SUCCESS IS A PRODUCT OF THE COMBINED EFFORTS OF THE LEADER AND THE LED. Both are dependent upon one another, but responsibility to align goals and objectives of each to achieve an agreed upon vision for the organization falls squarely on the leaders' shoulders. This transformational approach facilitates capitalization of Millennial talent and abilities far better than transactional leadership. It aligns individual and collective purposes for a desired outcome in the near term and solidifies a leader's legacy into the next generation.

DO NOT UNDERESTIMATE THE IMPORTANCE OF A MILLENNIAL'S RELATIONSHIP WITH THEIR PARENTS. They are close and you should expect to see the Millennials' parents in the work environment. Promotions, award ceremonies, school graduations, and Uniform Code of Military Justice procedures are all events parents will

be involved in and leaders must have an engagement plan. Compounding the challenge is unit deployments because the parents will expect to be included in the information loop. Success is getting ahead of the bow wave and engaging the parents first. Establish a means to communicate with them and push information. For those who are relatively local to the unit installation, get them involved in unit activities. They will be some of the strongest supporters within unit support groups. Don't lose sight of the added benefit an engaged parent can play in the retention process of their son or daughter.

ESTABLISH A COMPREHENSIVE LEADER DEVELOPMENT PROGRAM ACROSS THE ENTIRE ORGANIZATION. Invariably, someone is going to fall by the wayside and another person will have to step up and fill their position. Successful organizations are those who have trained and prepared everyone to fill their boss's boots. Millennials seek to be challenged and are achievement oriented. Aggressive coaching, teaching and mentoring are paramount in developing them to become leaders. Important to this approach is recognition that the youngest Millennials are short on experience and know how. Mistakes are going to be made. The leader's job is to help the Millennials recognize mistakes and understand how to execute better next time. Flexible and

adaptable leaders who can think and recognize when change needs to be made based on a changing environment is critical to the success of any organization.

FOSTER AN ENVIRONMENT WHERE LEADERS ARE ENGAGED WITH SUBORDINATES. Millennials are accustomed to being connected and welcome a leader's interest. Being engaged enables leaders to build knowledge of people. The knowledge that is developed through engagement provides better understanding for leading, creates opportunities to communicate organizational vision, goals, objectives and develop mutual trust between the leader and led. Being engaged as a leader also promotes mentorship between the leader and follower through two-way feedback, helping one another to better see and understand themselves and the organization.

ALLOW FOR COLLABORATION AND INDEPENDENT LEARNING. The focus needs to be on outcomes based training for Millennials. Permit Millennials to transition to the 'hands-on' phase as soon as possible. The military must also build systems and procedures to allow feedback to Millennials via virtual systems. Millennials need to know why tasks are important and how they fit into the organization. In other words, the Millennials must receive more 'why' and fewer lectures during training. Counseling and feedback are a must and

negative feedback to Millennials must be conveyed in a positive manner. Senior leaders must foster a command climate that allows Millennials to be active members of the team and provide them opportunities for education online and off duty.

THE DEPARTMENT OF DEFENSE SHOULD FACILITATE A MILLENNIAL STUDY AND THEN HOLD A MILLENNIAL CONFERENCE TO ANNOUNCE AND DISCUSS THE RESULTS OF THE STUDY. Representatives from the academic and business communities as well as the military should be invited to participate in this conference. A representative number of Millennial officers and enlisted members from across the military should also be invited to participate. The business community may be able to contribute some best practices and ideas on how to better lead Millennials. In turn, the DoD must conduct a survey focused on Millennials providing feedback about their leaders, training environment and attitudes towards the service. This forum will provide the military invaluable information with which to look at how it's leading Millennials.

RELOOK REWARDS AND ENCOURAGE COMPETITION FOR MILITARY MEMBERS. The time is long overdue for the DoD to relook how it rewards its members. Medals are tradition and should be maintained, but time off, monetary rewards and education matter more to Millennials. Millennials are extremely ambitious; reward often.

The Millennial Generation is uniquely talented with an abundance of positive traits

and characteristics. They are a product of the environment in which they have been raised and hold tremendous potential for being the next 'greatest generation.' Through effective application of the four components of transformational leadership, transformational leaders are much more capable of capitalizing on the social and work-place traits and characteristics of the Millennial Generation. Aligning goals and objectives of individuals with those of the organization and appealing to the Millennials' expectations is critical.

Millennials constitute the majority of those serving in uniform today and leaders who take a transformational approach will be effective in achieving organizational success. The power and policy making authority in the U.S. military lies with the senior leadership reared in the Baby Boomer generation. Ethnocentrism plays a significant role in the military's resistance to adapt to accommodate the Millennials, due to the fact that the Baby Boomers who make the policies see nothing wrong. Baby Boomers created the current policies and found success with them in the past, but the demands of the 'Long War' in which we are currently engaged necessitates that DoD adapt a broader leadership model to more effectively lead and accommodate our Millennial warriors. When it comes to warfighting and leading Millennials, selecting the right tool is the difference between success and failure.

Editor's note: The first half of this article was published in the November-December 2010 edition of *Fires*.

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THE
FIELD ARTILLERY
JOURNAL

JANUARY-MARCH, 1911

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EDITOR

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The Field Artillery Journal

Vol. 1 JANUARY-MARCH, 1911 No. 1

THE UNITED STATES FIELD ARTILLERY ASSOCIATION

Soon after the separation, in 1907, of the field artillery from the coast artillery, the question of the organization of a field artillery association and of the publication of a magazine in the interest of that arm of the service began to receive attention, and during the next three years there was considerable correspondence on and discussion of the subject. By the first of June, 1910, the correspondence had shown so much interest among field artillery men in the formation of an association and so many had expressed an earnest desire for and their willingness to support a field artillery journal, that it seemed evident that an organization could be made a success. A number of officers of the field artillery of the regular army and the organized militia were assembled at Fort Riley, Kansas, to participate in a school of instruction, and on June 7, 1910, a meeting of these officers was held to take the subject under consideration. At that meeting an organization was formed and a constitution adopted. The constitution contains the following provisions:

The Association shall consist of (1) active members and (2) associate members.

The following shall be eligible to active membership:

Commissioned officers on the active lists of the field artillery of the regular army and of the organized militia of the several states, territories and District of Columbia; provided, that officers of the regular army when separated from the field artillery, by promotion or detail in staff departments, shall not thereby lose their status as active members.

The following shall be eligible to associate membership:

(a) Commissioned officers on the retired lists of the regular army and of the organized militia of the several states, territories and District of Columbia.

(b) Those, who, as commissioned officers, either regular, militia or volunteer, have served with batteries or larger units of field artillery in time of war.

(c) Commissioned officers of the regular army and of the organized militia of the several states, territories and District of Columbia, not now belonging to the field artillery, who have served at least one year as commissioned officers in field artillery.

(d) General officers of the regular army, except as provided in Section 2 of this Article, and of the organized militia of the several states, territories and District of Columbia.

(e) All commissioned officers and former officers of the United States Army, Navy and Marine Corps, and of the organized militia in good standing, not included in the classification hereinabove set forth.

(f) Those in civil life, whose applications are approved by the Executive Council hereinafter provided for.

Any person eligible, under the foregoing article, to membership, may become a member by making written application to the Secretary and paying the first year's dues. The decision of the Executive Council as to eligibility of an applicant shall be final.

Any member may withdraw from the Association at any time

by tendering his resignation in writing, but such resignation shall not take effect until such member has paid all indebtedness due the Association at the time of such resignation.

Any member may be dropped for cause by a majority vote of the Executive Council; but no member shall be so dropped without first previously notifying him, in writing, at his last known post-office address, of the proposal to so drop him, and waiting a reasonable time for his reply.

A member dropped under the foregoing section may be reinstated by a majority vote of the Executive Council, and by paying all sums, if any, due the Association.

Active members only shall be entitled to vote.

The annual dues of the Association shall be fixed by the Executive Council, but shall not exceed \$4 per annum.

The Executive Council shall be composed of five active members, three of whom shall be officers of the regular army, and two officers of the organized militia, to be elected biennially for a term of two years by a majority vote, in person or by written proxy of the active members. The Council shall hold its meetings at the headquarters of the Association, which shall be in the city of Washington.

The Executive Council shall appoint the following officers of the Association:

1. A President, to be selected from its own members, and who shall be an officer of the regular army.

2. A Vice-President, to be selected from among the active members of the Association.

3. A Secretary-Editor, to be selected from its own members, or other active members of the Association, and who shall be an officer of the regular army.

4. A Treasurer, to be selected from among the active members, and who shall be an officer stationed or residing in Washington, DC.

These officers shall hold office at the pleasure of the Executive Council, and shall perform the duties usually and customarily performed by like officers in civil associations.

At the same meeting the Executive Council was elected, as follows:

Brigadier-General M. M. Macomb, U.S. Army.

Captain Oliver L. Spaulding, Jr., 5th Field Artillery, U.S. Army.

Captain Fox Conner, General Staff, U.S. Army.

Captain John F. O'Ryan, 1st Battery, National Guard, State of New York.

Captain Robert H. Tyndall, Battery A, National Guard, State of Indiana.

At a meeting of the Executive Council, held in Washington, D. C., November 3, 1910, the organization of the Association was completed and the following officers elected:

PRESIDENT: Brigadier-General M. M. Macomb, U.S. Army.

VICE-PRESIDENT: Lieutenant-Colonel E. St. J. Greble, General Staff, U.S. Army.

SECRETARY-EDITOR: Captain Wm. J. Snow, 6th Field

TREASURER: Captain Wm. J. Snow, 6th Field Artillery, U.S. Army. Artillery, U.S. Army.

The Council passed resolutions fixing the subscription price of the magazine at \$4 a year, and life membership and subscription at \$100, and providing that there shall be no annual dues, a paid subscription to the magazine for at least one year being substituted therefor.

The present management has undertaken the work of publishing THE FIELD ARTILLERY JOURNAL with confidence in the ultimate success of the enterprise; but not in the belief that success

can be accomplished by the efforts of the management alone, for if any considerable degree of success is achieved it will only be by the united efforts of practically everyone directly connected with the field artillery in the United States. Assurances of support have been received from nearly all of the field artillery men in the regular army and from many of those in the organized militia; but even among these there are a number who have not yet subscribed. We have received a number of subscriptions from officers of other arms, and the management bespeaks the good offices and help of each individual reader of the magazine, not only on behalf of the field artillery, but generally "for the good of the service."

HOW CAN THE EFFICIENCY OF FIELD BATTERIES OF THE ORGANIZED MILITIA BE INCREASED?

By * * * * *

The recent report of the Chief of Staff of the Army contains the following:

"MILITIA

"The field artillery is specially in need of this assistance from the National Government. Because of the absence of this assistance the instruction of this arm is far from satisfactory. Indeed, speaking in a general way, we may say that it is, with the exception of a few batteries, practically uninstructed in field duty and wholly unprepared for service. The gravity of this situation becomes evident when it is remembered that in both the regular army and the militia the field artillery falls far below its proper proportion with respect to the other arms."

"MOBILE ARMY

"Field Artillery—The existing deficiency in the field artillery constitutes one of the greatest menaces to our country in case of war. * * * * * Under the heading 'Militia' the condition of militia field artillery has been stated. It is, with the exception of a few good batteries, very unsatisfactory."

These remarks of an officer in a position to know whereof he speaks disclose a serious situation, and at once suggest the question. "Is there any remedy for this, and, if so, what is it?"

The writer of this article has heard some officers of the regular army (fortunately not many) state that militia batteries can never be made effective. But he does not share this opinion. Rather, the writer believes that the American can accomplish anything within reason, and that to be an efficient field artilleryman comes within this category; that it is merely necessary to provide the American with time and facilities and he will accomplish his object. But the writer does not believe that the American, any more than the man of any other nationality, can accomplish the impossible. And yet it looks as though, under the present conditions, this is exactly the task we have set for the militia field artilleryman.

To determine the remedy to correct a general defect, we must analyze the latter into its specific elements, and then we are in a position to apply specific remedies, to be definite in our statements and, accordingly, an attempt is made in the following pages to carry out this procedure. This will involve at least a hasty glance at the subject in its entirety, from which we pass to details.

Relation Between Field Artillery and Infantry

The old aphorism, "the infantry is the Army," is still true, but fire action has, in recent years, so developed that unaided infantry can no longer advance.

The volume and range fire from the magazine rifle, the use of smokeless powder, and the evolution of the rapid-fire, indirect laying, shielded field gun, have so modified battlefield conditions that movements in the open of infantry in close order have become practically impossible, and the old battlefield pictures of troops maneuvering on the field gave place in the last war (the far east) to an "empty battlefield."

Nowadays, troops in the presence of each other burrow like moles to escape observation and to secure protection from fire. If we assume for a moment the action of advancing infantry, which is necessarily more or less exposed, against entrenched infantry, neither side being assisted by artillery, we find that, theoretically, the loss on each side should be in proportion to the amount of surface exposed, or about as 5 to 1. Practically, it has been found that the ratio is much greater. For, in reality, a man under cover can hardly be reached by the flat trajectory of the small-arm; to do so requires an accuracy of fire which infantry cannot hope to attain under the conditions and emotions of the battlefield. It therefore becomes necessary for the advancing force to receive further assistance than its own rifles to enable it to hold down the fire of the defenders. This is accomplished by the artillery, which, by bursting shrapnel in the air near the enemy's trenches, reaches the personnel behind the trenches, thus preventing these men from rising to fire. Either side being provided with artillery, the other side must also be so provided, for only artillery can effectively combat artillery; the infantry bullet is harmless against artillery shields, even if it reaches them in the concealed positions which are now recognized as the rule throughout the world. Holding down the enemy's infantry and artillery fire by our artillery enables our own infantry to advance. In addition, only the heavier projectiles of the artillery can remove or destroy material obstacles in the way of our advancing infantry. The result of these conditions is a greater dependence of the infantry on its artillery.

In addition to the material result which the artillery thus accomplishes, this arm is well known to furnish the greatest possible moral support to the infantry. This fact is recognized by all authorities, and with the greater nervous tension on the infantry, due to modern warfare conditions, the need for moral support has also increased; again, the more untrained the infantry, the greater the need for

moral support. Hence, while the field artillery is always auxiliary to the infantry, it has become a vital, essential, and indispensable adjunct. Such a thing as a large force of infantry without artillery has now become inconceivable; it would not be worth placing in the field!

The union between infantry and artillery is so close that in all modern armies the two arms are closely associated in time of peace as well as in war, and the drill regulations of each arm contain copious references to the action of the other arm. In Germany, when "the line" is spoken of, infantry and artillery are meant, all other troops being regarded as auxiliary but these two being always classed together. This intimate relation between infantry and field artillery is not generally understood in the United States.

Field Artillery in Foreign Armies

The increasing importance attached to field artillery in foreign armies is shown by the following statement of the number of field (light, horse, and mountain) batteries maintained in 1909. The figures are from Von Loebell's reports, and only the active standing army is considered.

Germany	has over 570 batteries
France	has 631 batteries
Russia	has 549 batteries
Austro-Hungary	has 325 batteries

As an indication of the strength in field artillery of minor powers, the following is given (the figures are for the year 1909):

Brazil	64 batteries
Bulgaria	90 batteries
Belgium	34 batteries
Chili	22 batteries
Sweden	54 batteries

The United States has but 36 batteries in its standing army.

From another source of information, believed to be even more correct than the foregoing, it is learned that the following is the number of guns maintained in the standing army in peace of each of the countries mentioned:

France	2,936
Germany	3,866
Austria	1,854
Russia	4,432
England (in regular army)	1,170
" (in territorial army)	1,000
Italy	1,470
Mexico	176
Japan	954 light
"	220 heavy
United States	144, including mountain, light, horse, and heavy.

No comment would seem to be necessary as to our inadequate number of guns.

Classification of Guns

Not only has the proportion of artillery to other arms considered necessary with the army been greatly increased in recent years, but there has also been a corresponding development of classes of

artillery in order, so to speak, to obtain a tool adapted to each class of work. Briefly stated, field artillery is of the following classes:

1. Mountain, light, or horse artillery.
2. Heavy field artillery.

In each class there is both a gun and howitzer, the latter intended by its curved fire to supplement the direct fire of its corresponding gun. These classes of artillery are part of the mobile army. They exist in time of peace, are horsed and equipped at all times, possess enough mobility to accompany an army, and according to all authorities may be expected to be present on every battlefield.

After heavy artillery comes siege artillery, or position artillery, this being a class which is brought up to the front for particular occasions, is not permanently horsed, requires special platforms or anchorages, and is handled by fortress artillerymen. These fortress artillerymen, a class not existing in the United States, garrison the land frontier forts, which are equipped with much lighter guns than our coast forts.

Another special class of artillery that is being developed is for the attack of balloons. But all aeronautical matters can well be left in abeyance until more pressing needs are provided for in the United States.

Our own Ordnance Department, is keeping abreast of developments of artillery abroad; has designed for the United States field artillery the following guns:

1. 3-inch mountain gun, throwing a fifteen-pound projectile, and to be carried by pack transportation.
2. 3-inch field artillery, light, throwing a fifteen-pound projectile, and with about 4,000 pounds behind the horses. This gun is
3. An intermediate gun, throwing a thirty-pound projectile, and with about 5,000 pounds behind the horses.
4. A howitzer of the same caliber and firing a projectile of the same weight, and with about 4,000 pounds behind the horses.
5. A 4.7-inch heavy field gun, throwing a sixty-pound projectile, and with about 8,000 pounds behind the horses.
6. A light howitzer, of the same caliber and throwing a projectile of the same weight, and with about 5,000 pounds behind the horses.
7. A heavy field howitzer, 6-inch caliber, throwing a 120-pound projectile, and with about 8,000 pounds behind the horses.

With the exception of the thirty-pound gun and howitzer, there is no question but that all of the above calibers are essential and should now be in commission.

It is understood that a heavier gun than any of the above is being designed for siege purposes but to which branch of the artillery—field or coast—it will be assigned is unknown to the writer.

Of all of the above mentioned field artillery guns and howitzers, there are actually in service at the present time only the 3-inch light gun. It is understood that the mountain gun will soon be placed in service and also the 4.7-inch gun, but the latter only at the cost of withdrawing a corresponding number of 3-inch guns.

It is important that all of these types of guns and howitzers be placed in service in order that their drill regulations may be prepared and that troops may become more or less familiar with the use of this ordnance before actually taking the field. The importance of these guns and howitzers to the mobile army is not generally understood in the United States.

Shortage of Field Artillery in the United States

The thirty regiments of regular infantry will form three and one-third divisions, requiring under the Field Service Regulations six and two-thirds regiments of light and mountain artillery; there are in existence five regiments of this artillery.

The fifteen regiments of cavalry will supply cavalry for the divisions mentioned above, and also enough for a cavalry division requiring one regiment of horse artillery; there is one regiment of horse artillery in existence.

The three and one-third infantry divisions will require three and one-third battalions of heavy field artillery; there are none in existence. Of the ten regiments of field artillery that are now required, therefore, for divisions which may be formed from existing infantry and cavalry, we have but six in existence. There are enough militia infantry regiments to form about sixteen divisions requiring thirty-two regiments, or 192 batteries of light and mountain artillery; there are in existence fifty-one batteries. These divisions would require sixteen battalions of heavy field artillery; there are none in existence.

The regular army, therefore, contains about one-half as much artillery as is needed for the regular infantry and cavalry, and the militia contains about one-fifth or one-sixth as much artillery as it needs for existing infantry.

Bearing in mind the close relationship existing between infantry and field artillery, it may be said that the fighting value of unaided or inadequately supported infantry increases in direct proportion to the number of regiments only up to a certain point; beyond this each added regiment of the infantry adds a lessening proportion of increased strength. The forces of the United States have long since passed the point of maximum value, and, with our poorly proportioned army (both regular and militia, considered together or separately), we have now reached the point where the strength of the army can be most effectively increased by favoring in effort and money organizations of field artillery rather than of other arms. In other words, our critical shortage of field artillery should lead us to strain every point to bring what we have to the highest attainable efficiency and then to create more of this arm.

Efficiency of Present Militia Batteries

Of the fifty-one batteries of the militia now in existence (last report Chief of Division of Militia Affairs), only forty-four are equipped with the 3-inch rapid-fire guns. Of these forty-four batteries, very few have any real or potential efficiency in them under present conditions. As an illustration of the character of the average militia battery, the following extracts from the inspection reports of the last inspection of seventeen batteries are given:

1. Recruited from element of doubtful character.
2. Efficiency as field artillery almost nullified.
3. About sixty-five per cent consists of recruits of about four months' service.
4. Present efficiency is very low and fire discipline very indifferent.
5. Efficiency low; service of pieces slow and fire discipline indifferent.
6. Fire control and direction very poor.
7. Average knowledge of guns and service not high.
8. Battery demoralized.
9. Privates not thoroughly informed as to duties of cannoners.
10. Men possess fair knowledge of standing gun drill, but officers are in need of much instruction, particularly conduct of fire.
11. Could not as field artillery be expected to go anywhere.

12. At present know little about field artillery.
13. Battery as a whole inefficient and lacks interest.
14. Very slow at drill; not efficient, captain lacks knowledge of drill regulations.
15. Not at present efficient.
16. Command is far from field service efficiency.
17. Officers not up to requirements in instrumental work and handling firing data.

The inefficient condition of state batteries is not generally appreciated by state authorities.

Hasty Improvisation

The relation of field artillery to the other arms, its importance to them, and the internal difficulties in organizing, equipping and handling it, have never been understood or appreciated in the United States. There still exists to some extent the opinion that this arm can be improvised or hastily created upon the outbreak of war. This opinion, always ill-founded, is absolutely wrong to-day.

Misunderstanding as to the field artillery in the Civil War led General Hunt, Chief of Artillery in the Army of the Potomac, in his final report, dated June 5, 1865, to state:

"I do not hesitate to state that the field artillery of this army (Potomac), although not inferior to any in our service, has been from one-third to one-half less efficient than it ought to have been, while it has cost from one-third to one-half more money than there was any necessity for."

But artillery conditions in that war were simple as compared to present requirements. The guns were mostly smooth-bore, the range was short, the laying appliances were extremely simple, and the principal work in fighting the guns consisted merely in getting them on the line and then firing almost point blank. There were no mathematical computations of firing data; there was no shrapnel fire to adjust in three directions; there was no sheaf of fire to manipulate there were no delicate, accurate instrumental scales to set, bubbles to center, etc., as there now are. Such targets as could be reached were at short range and quite visible; consequently no elaborate training in observation and communication was necessary for the personnel.

At the present time, both in the War Department and in the militia of the several states, field artillery is theoretically on the same footing as other arms. In the militia, a company is largely regarded as a company, whether under the designation of company, troop, or battery. As a matter of fact, the field artillery is worse off than the other arms, because there is an actual hostility among the states against the arm, partially due to lack of understanding and partially to the cost of maintaining it.

The result is, that we are drifting along the same way as before the Civil War; but the consequences of such drifting will be more disastrous in the next war, for the requirements to obtain efficiency in field artillery are now much greater than they were then. It is now absolutely out of the question to obtain efficient field artillery by hasty improvisation. It will be long after our existing infantry and auxiliary arms, other than field artillery, have taken the field before any artillery support can be obtained from batteries organized or created at the outbreak of war. That we are now sadly lacking in artillery for our existing infantry and cavalry has already been pointed out.

Proof of the statement that a long time is now required to obtain efficient field artillery is seen in the recent war in the far east.

The Russians had a gun that overmatched the Japanese in every respect—range, flatness of trajectory, rapidity of fire, and weight of projectile—yet it was not until after the first year of the war that the Russian artillery could cope with the Japanese or furnish its infantry the support the Japanese gun furnished its infantry from the very first battle. This was due simply to the fact that the Russians were unfamiliar with their gun, it being a new one issued to them at the outbreak of the war and one with which they had never practiced. And in this connection two things must be borne in mind: First, the Russians were already organized, possessing artillery knowledge, and not ignorant untrained men as would be the case in hastily raised batteries in the United States; and second, the gun it took the Russians months and months to learn even in war was far more simple than the present rapid-fire gun with which all nations are now equipped. The Russians, themselves, since the war, have adopted the true rapid-fire gun the use of which is based on radically different principles from that of its predecessors and requires an immensely increased amount of training to utilize its inherent powers.

The amount of training required to obtain an effective firing battery is not generally understood in the United States.

Resume

An attempt has been made in the foregoing pages to briefly present the field artillery situation in the United States. It may be summed up as follows:

1. Considering only existing regiments of infantry, there is about one-sixth enough field artillery to support these regiments.
2. This shortage of field artillery would in real war very largely negative the efficiency of the infantry.
3. In failing to make adequate artillery provision, we are pursuing a policy diametrically opposed to the rest of the civilized world, or rather, we are neglecting to have a policy.
4. The absolute dependency of large masses of infantry upon its artillery is not generally understood in the United States.
5. There will appear against us in any large war special classes of ordnance with which we cannot cope unless we previously get into service the same classes of ordnance, now being manufactured by our Ordnance Department.
6. Of the existing militia field artillery, a large part has practically no efficiency at present.
7. The artillery deficiency cannot be overcome by hastily improvising batteries when the emergency arises.

In the preceding remarks, no attempt has been made to entertain certain other important field artillery considerations from which we suffered during the Civil War, such as higher organization and ammunition supply, but attention has been concentrated on our present policy of maintaining an inadequate quota of this arm.

Specific Defects in Militia Batteries

By passing now from a consideration of our generally deplorable condition to the specific defects in existing units of the organized militia, we can determine the cause of these defects and hence the remedies to be applied.

Of the two actions in battle, shock and fire, the latter long ago became the predominating one. Field artillery is the highest development of fire action. It applies machine and mechanical action more than any other arm. It has no action except fire. But it cannot fire until it gets into its firing position. To get there it must be able

to march. Marching is the combined work of men and horses.

Untrained horses may have to be used in war; but an untrained driver on an untrained horse is a poor combination for moving a heavy load. At present drivers are untrained, due to lack of horses with which driving can be learned. But before a man can drive well, which involves managing two horses, he must be a sufficiently good rider to be able to devote his undivided attention to his pair without the necessity of devoting attention to his riding. Hence, before he can learn to drive he must learn to ride. There is no known way of learning to ride except by mounting a horse, and, as states make practically no provision for horses, the drivers are as a rule poor riders.

Again, when pairs of horses are combined into a six-horse team, the difficulty of management is further increased. It is not generally appreciated in the service, much less in the United States at large, that a great deal of training is necessary to make a good artillery driver out of a good rider or other horseman. Moreover, in the marching and maneuvering of artillery, there enters not only the skill of the individual drivers, but in addition the noncommissioned officers and the officers must possess knowledge as to the management of the horses. This knowledge is not possessed at the present time, nor can it be acquired without the presence of horses.

It is true that at maneuvers, militia batteries, as a rule, manage, ultimately, with their untrained men and horses, to get into position; but it is equally true that usually this is done too slowly and too confusedly to be of use in campaign. And the only reason they are able to do this even in peace is on account of having empty ammunition chests. Filling the caisson with ammunition as in campaign adds 90 per cent to its weight, and under this latter condition the average militia battery could neither maintain its place in a marching column nor get into its firing position. All of these deficiencies are manifestly due to lack of horses.

Working horses can be maintained in condition only by properly fitted and adjusted harness; but to learn to fit and adjust harness requires horses. Furthermore, horses can be maintained in serviceable condition in the field only by proper care; but without horses in time of peace the proper care of them will not be learned. It is safe to assume that if the men have not learned in peace how to care for horses, the latter will receive scant attention in campaign, with the result that the battery will soon be immobilized.

Hence, the first class of deficiencies is:

- (a) Poor riding.
- (b) Poor driving.
- (c) Poor management of six-horse teams.
- (d) Ignorance as to fitting and adjusting harness and saddles.
- (e) Ignorance as to stable duty and care of horses.

The remedy is, to have in the battery sufficient horses for instruction purposes. In the very few brilliant exceptions, where the battery maintains a nucleus of horses, the defects herein stated do not exist to any appreciable degree, conclusively proving that militia batteries can acquire and apply the necessary knowledge connected with the horse part of the battery if given the requisite facilities.

And it must be borne in mind that if we include horses in the facilities we must include men to care for them. The number of men need not be great (anywhere from five to twenty), but they should be permanently enlisted in the battery, should care for the horses and be proficient in all matters properly pertaining to the duties of an enlisted man; they could thus also act as instructors and would form a nucleus of trained men that would make its influence felt in leavening the mass of other men that might at any time be taken

into the battery.

Hence, the first need can be summed up by saying it is a nucleus of trained men and horses.

It is frequently assumed that of the two essential features of field artillery (the horse or marching part and the gun or firing part) the former at present is, for the militia, the weaker end in efficiency. Actually this is not the case. Militia batteries are no more efficient in delivering an effective fire than in marching; in fact, they are probably less efficient. Efficiency in firing is wholly the work of the personnel, commissioned and enlisted; and, with the notable exception of a very few batteries, there is now a total lack of adequate instruction in this work. As a rule, the officers have not sufficient knowledge of reconnaissance to reconnoiter an approach and select a suitable position and install the battery therein for firing. This is important, for if struck by fire when limbered the battery is practically helpless, as it cannot, as can infantry, conceal itself by lying down in a fold of the ground. To assist the captain, there are provided by the Drill Regulations "Information and Communication details." These are at present untrained; generally they have never even been appointed. Some officers do not even know the firing commands, many do not know how to compute firing data, and very few are able to manipulate the sheaf of fire. Some of these defects in officers are due to lack of instruction. In some cases they are due to lack of elementary education, the officer being unable to use a simple formula involving algebraic signs.

But, aside from the question of efficiency of the officers of a battery, they cannot deliver an effective fire without properly instructed enlisted personnel. That a battery is a firing machine is the conception of the present rapid-fire gun. The machine sows a selected area with shrapnel balls by turning a rafale on it, the density of balls per square yard being adapted to the situation existing; the desired result accomplished, the sheaf of fire is shifted to another target. This conception is essential, for troops now present only fleeting targets. The idea is entirely opposed to the old one (which was suitable to older types of ordnance) of an aggregate of individual guns keeping up a continuous bombardment. Rapidity and accuracy in the setting of instruments is essential to the working of the firing machine. These requisites do not, as a rule, exist at present. Occasionally a battery is found that has accuracy, but it is thought that not over three batteries in the United States combine accuracy with rapidity. To secure this combination, the Drill Regulations subdivide the work of loading and laying so that each man has only one or two things to do; but, necessarily, this subdivision of labor makes each man dependent upon every other. Nowhere is the necessity for cooperation so vital as in the field artillery. One man failing to do his part will delay or negative one gun—that is, 25 per cent of the battery. Hence the necessity for a high degree of training in the individual man of the gun squad. In addition, the captain adjusts his fire by corrections based on observations of rounds just fired. If the gun detachment is inaccurate in its work, the firing is erratic, the captain never gets his fire adjusted, and, therefore, it will never be effective; hence, the net result will be merely a waste of ammunition—and waste of a round of ammunition in field artillery is very different from a waste of one round of small-arms ammunition.

Batteries capable of delivering an effective fire adapted to the tactical situation are vital to the infantry; a battery incapable of delivering such a fire will be at best merely a useless expense and an annoyance, and may be an actual impediment and source of weakness requiring assistance from other arms to extricate it or possibly save it from capture. A battery can be capable of delivering an effective fire only when each individual enlisted man in it is thoroughly trained, when the entire personnel is trained to work together, and when the captain is a master in handling the machine

thus created and in skillfully manipulating the sheaf of fire delivered by the machine. Failure in any part of these requisites causes the machine to break down, and the very rapidity of fire of the gun will result within a few minutes in wasting the entire ammunition carried, for all the ammunition carried with a battery at war strength can be fired away in about half an hour.

The proper training of the personnel in all that relates to fire can be accomplished in militia batteries, but it requires facilities and opportunities, time and money. These requisites do not at present exist, and hence the untrained condition of the personnel. These requisites are considered below:

(a) Facilities and opportunities for drill and practice.

As stated in the last report of the Chief of Division of Militia Affairs, instruction commences with that of the armory and passes up through the state encampment to the culmination in combined maneuvers. But at present, according to inspection reports, (see report Chief of Division of Militia Affairs), the armories are, as a rule, inadequate and poorly adapted for the purpose. The armory, or foundation part of the scheme, being defective, naturally the whole structure falls to the ground. An armory should be large enough to permit placing the four guns in line for instruction in the firing battery, and as most of the drilling is done at night the armory should be so lighted that the scales and bubbles on sights, etc., can be easily read. In addition, there should be a clear space in rear of the gun for the erection of aiming points, and space enough in front for firing sub-caliber cartridges, with a suitable back stop. The armory should also contain a riding ring, or there should be one available and conveniently located. Assuming that suitable armories have been erected in which the appropriate elementary indoor instruction for both officers and men has been held, both mounted and dismounted, the state encampments would afford facilities for carrying this instruction to the next higher degree; but these should be artillery encampments, in order that the batteries may receive necessary instruction in the technique of artillery and not be required to participate in combined problems for which they are at present wholly unready and which divert them from vastly more necessary work. State troops armed with the small-arm go into camp annually and hold target practice, and in addition the law provides each regiment and separate battalion with an inspector of small-arm practice; yet, for the field artillery, which has no action except fire, there is no such requirement, and no provision for firing instructors. It is an absolute impossibility to obtain fire efficiency in the field artillery under these conditions. Batteries should be required to hold target practice as soon as they have reached such a degree of development as will render such firing instructive to them. Many have not yet reached this stage, and many never will unless more encouragement is given in the future than in the past.

Finally, as has already been indicated, the field artillery officer requires a high degree of training, and to assist him in this respect the special elementary summer school established at Fort Riley last June should be maintained until each and every militia officer outgrows it. After that, they should attend the proposed School of Fire at Fort Sill, under provisions and regulations that need not be considered now.

Of immediate assistance toward securing a better standard and in preparing the batteries for their summer encampment and for target practice, would be the detail to each battery so desiring it of a noncommissioned officer from the regular field artillery. This simple act would require no legislation, would involve but slight expense, and is believed to be desired by numerous battery commanders. This noncommissioned officer should be used entirely as an instructor, and not as a laborer, clerk, or caretaker of the

armory. Classes should be ordered to Fort Riley (which seems to be our field artillery center of information) for a special course of instruction prior to being detailed to militia batteries, and should be given a course of instruction relating exclusively to field artillery and calculated to make them of the maximum value to the militia of that arm; and finally, the men should be obtained by increasing the number of noncommissioned officers in certain regular batteries, which can now be done under the law. This would work no hardship on regular batteries.

But the capacity of a noncommissioned officer is limited, and, therefore, his instruction should be supplemented by that of regular field artillery officers. While ultimately there should be one such officer to each group of from three to six batteries, at present details should be limited, because of shortage of officers, to one to each of the Departments of the Lakes and the Gulf and two to the Department of the East. The first contains 10, the second 5, and the third 19 batteries, the first and third together comprising over one-half the militia field artillery of the United States.

The second detail (Department of the Gulf) is recommended on account of the very backward condition of the batteries stationed therein. It is not believed that four officers could be assigned to any other duty in which their services would be of equal value to the United States. But they should be carefully selected, and should be almost continuously at one battery or another. They can do but little good if merely stationed at Department Headquarters. Personal contact and instruction are needed, not written communications. It is idle to think that field artillery will ever be made efficient without supplying competent instructors to the national guard.

(b) Time and money.

Although it is not generally recognized, it is a fact that much more can be done even with the present lack of facilities than is being done toward securing efficiency. There is a great deal of instruction that can be given without enlarging the present armories or requiring horses. Reference is had to the training of officers in computing firing data and manipulating the sheaf, and to the instruction of the specialists (information and communication details). It is merely necessary for these men to go out in the country a few miles, taking with them such instruments and appliances as can be carried by hand. A ride on the trolley will generally take them into the open country where they can secure the desired practice. But this work will have to be done in the daytime, and most of the personnel are engaged during that time in making a living. If these men could be gotten out for one or two afternoons a week, a course that would double or treble the present efficiency of the whole organization in a short time could be laid out. But the men cannot in general be expected to be absent from their daily vocations unless they are at least partially compensated for their loss. This necessary training cannot be secured in an armory at night. Granting, therefore, that to secure efficiency a certain amount of instruction must be given in the daytime, and that daytime instruction cannot be secured without compensation, the question arises, where is the money to come from? The number of field artillery officers in any state is so small as compared with the infantry and other officers, and the demand from all sources for money is so great, that the field artillery cannot make its voice heard. Were the infantry thoroughly conversant with the absolute necessity for field artillery support, the infantry would itself insist on more adequate training of the field artillery. But only a large engagement in actual campaign will make the question of support understood. Then there will be a demand from one end of the land to the other for artillery. Field artillery officers generally complain that they cannot get enough money to even approximately enable them to secure efficiency. It is

a notable fact that one battery of the middle Atlantic states, which secures a large annual sum of money and has special opportunities in the management of its finances, compares very favorably with the regular artillery. The only solution, then, is a special and distinct appropriation for field artillery. This will have to come from either the states, individually, or from the United States, or partly from each. But to get the states themselves to make a distinct field artillery appropriation is regarded as hopeless. There would be too much opposition, and to sufficiently educate public sentiment in each state would be the work of years during which the field artillery would remain in its present inefficient condition. Moreover, there is at the present time a feeling that this is a distinctly national arm, unsuited to state police purpose, and that it is not right to ask the state for liberal appropriations for it. Whether this sentiment is right or wrong, it exists and must be reckoned with. Therefore, the only remedy is for the federal government to make such an appropriation.

The second class of deficiencies, therefore, is:

1. Inadequately trained enlisted personnel in firing duties.
2. Untrained condition of enlisted specialists.
3. Untrained condition of officers in using specialists.
4. Untrained condition of officers in handling firing battery.
5. Untrained condition of officers in computing firing data; in some cases insufficient elementary education to learn the work.
6. Inadequate armory facilities for instruction.
7. Lack of target practice.
8. Lack of instructors, noncommissioned and commissioned.
9. Lack of daylight instruction.
10. Lack of financial support.

And all of these could be remedied by a sufficient appropriation and by the detail of a few officers and men of the regular field artillery.

Conclusion

The steps to be taken to secure greater efficiency in batteries of the organized militia, mentioned in the order of ease with which they can be taken and the advantages that would accrue, are:

1. Continuing to hold annually the elementary instruction camp for officers at Fort Riley, Kansas.
2. Detailing a class of field artillery sergeants, similar to that prescribed in General Orders, No. 60, War Department, series of 1909, by increasing the strength of certain batteries in the United States field artillery, the class to consist of about 35 men, to report at Fort Riley, Kansas, for a course of instruction somewhat similar to that prescribed by Circular, No. 29, War Department, series of 1909, but specially designed to meet the needs of the field artillery. Upon completion of the course the men would be assigned to such batteries as governors of states may request.
3. Detail of a suitable field artillery officer of the regular army for duty in each of the Departments of the Lakes and the Gulf and two to the Department of the East, under suitable instructions to the commanders thereof. These officers should be traveling instructors, the matter of dates and details to be arranged by correspondence between the department commander and the governors of states concerned; the number of officers so detailed to be increased later, as circumstances demand and conditions require, and all officers so detailed to be in touch with the central militia authorities in Washington.
4. Provision for the attendance of militia field artillery officers at the proposed School of Fire at Fort Sill, under such restrictions as

the War Department may impose, such for instance as the states defraying a part or all of the cost of such officer's attendance; and admission to the school might be extended to only those officers who, by previous examination at the Fort Riley instruction camp, are found to be sufficiently advanced to profit by the course at Fort Sill.

5. The passage by Congress of an appropriation act for the specific purpose of developing the field artillery of the organized militia, the appropriation to be expended, not according to Congressional representation under the provisions of Section 1661. Revised Statutes, as amended, or upon any other basis of numbers, but to be expended as the Secretary of War may see fit, upon the basis of obtaining efficiency. Participation in this fund should be held out as a reward for incentive. It is believed that to allow all batteries to participate in this fund as a matter of right would be a mistake and would not secure the best progress; but the opposite policy of progressively allotting just so much to any battery whenever it or its state accomplishes a certain result as determined by examinations and inspections by the United States, would act as an incentive and secure true

progress toward efficiency.

It is thought that in no way other than as herein indicated can the general apathy now existing be removed. Only by radical action can the field artillery ever be made efficient. The sooner the deplorable situation now existing is realized and appropriate steps taken to relieve it, the sooner shall we avert the disaster we are not inviting. We should either spend enough money on national guard batteries to get some real efficiency out of them, or else stop spending on them entirely money for which we would get practically no real return in the field. We are now either spending too much or not enough on the field artillery.

[The writer of this article has evidently devoted considerable time and thought to the subject, and it seems to be an excellent analysis of the situation with respect to the field artillery of the organized militia. Officers of the army and of the militia, without regard to the arm of the service to which they belong, are requested to express their views on the subject for publication in THE JOURNAL.—THE EDITOR

THE CARE AND TRAINING OF ARTILLERY REMOUNTS

BY CAPTAIN WM. J. SNOW, SIXTH FIELD ARTILLERY, U. S. ARMY.

General Orders, No. 188, War Department, October 14, 1910, reads in part as follows:

"1. Under normal peace conditions the total number of horses actually required as remounts for the Army should not exceed 10 per centum of the maximum authorized allowance of horses for each organization. Requisitions for horses for the cavalry and field artillery, riding horses for the mounted orderlies of the infantry, engineers, members of the Hospital Corps required to be mounted, the Signal Corps, schools and staff colleges, and Indian scouts will not exceed in any one fiscal year 10 per centum of the maximum authorized allowance of horses for the organizations for which they are intended, except when specially authorized by the Secretary of War.

"2. So far as practicable, horses will be furnished from the remount depots. Should this source of supply not be sufficient, the remainder will be supplied by purchase, as heretofore. Requisitions for horses should be submitted annually and forwarded through regular channels in time to reach the office of the Quartermaster General on or before March 1 of each year. Issues of horses from remount depots will be made as soon as practicable after the receipt of requisitions.

"3. As the young horses furnished from the remount depots will generally have been handled only with a view of making them gentle and accustoming them to weight carrying and preparing them to receive their military training, they should, upon receipt at posts or by organizations to which they are assigned, receive a careful course of training under the supervision of a graduate of the Mounted Service School whenever it is possible to obtain one, otherwise under a carefully selected and competent officer, before being placed in the ranks for regular military duties as troop and battery horses. Such training will continue as long as is necessary to qualify the horses thoroughly for the ranks, generally not less than one year. If the horses thus turned in are under five

years old they should have only moderate field service; six years old, full field service. In this training the fundamental principles laid down in the service manuals or taught at the Mounted Service School will be followed."

From this it is evident that the horses to be supplied to the army will hereafter as far as practicable be young untrained ones, and that they are to "receive a careful course of training" after being assigned to organizations. The order further indicates that horses are expected to last ten years in the service.

Sooner or later horses must be issued to mounted organizations of the organized militia as well as of the regular army. In view, therefore, of the foregoing conditions, it is thought that the following notes may be of interest to field artillery men both of the regular army and the organized militia. No claim is made that these notes are complete, or even that they set forth the best method of training; but it is thought that they will at least be of assistance to those officers who have charge of remounts.

For assistance in preparing this article, thanks are due Captain W. C. Short, Thirteenth Cavalry, and First Lieutenant Gordon Johnston, Seventh Cavalry, respectively Assistant Commandant and Senior Instructor in Equitation and Horse Training at the Mounted Service School, Fort Riley, Kansas.

Care of Remounts

Immediately upon their arrival horses should be inspected by a veterinarian, previous to taking them to the battery stables or corrals, any suspicious cases of infectious or contagious disease being at once thoroughly isolated. All the other remounts, even though showing no signs of disease, should be kept together in the most isolated part of the stable to prevent the spread of any incipient but undetected disease to the older battery horses.

Each remount should, if practicable, have a stall to himself; should be protected from liability to colds caused by drafts or exposure; and all remounts should be very carefully watched, as they are liable to develop shipping fever and distemper. Their

digestion is ordinarily disarranged, and they should be placed on a diet. Horses in civil life are fed three times daily, and as far as practicable the practice should be followed in the service. For the newly received remount a suitable diet would be: Morning, 3 quarts of oats; noon, 3 quarts of oats; night, 5 quarts of bran mash, made with cold water in summer and warm water in winter.

When the digestive system becomes normal, as judged by the droppings, the bran mash may be reduced in frequency to twice a week, but the number of mashes should be again increased whenever the digestive system shows the necessity therefor. As the mashes are diminished the oats ration may be increased, so that ultimately it would be about 4 quarts in the morning, 3 at noon, and 5 at night. The horses should have their allowance of hay, and all the good clear water they desire, at least before each feeding.

The following additional rules should be observed with the remounts:

None of the remount utensils, such as currycombs, brushes, blankets, bridles, buckets, watering-troughs, etc., should be used with the older battery horses.

Take the temperature of each animal, morning and evening. If in excess of 101 degrees, report the fact to the veterinarian.

Keep the horses warm, erring on the safe side, with blankets.

Keep a lump of salt in each stall.

Graze the horses, if practicable.

Lead the horses daily, equipped with a watering bridle, for a few days; at the end of a week, any latent sickness should have developed, and the well horses will be rested and in condition to begin training. But, even after the first week or so has passed, the horses should, during the entire period of acclimation and adaptation to military life, covering several months, be carefully watched. During any period of debility they should receive such exercise, not work, as may be beneficial.

If at any time during the training the horse gets out of condition or develops blemishes or unsoundness, his training should be immediately lessened to such an amount as is suitable to his condition. Especially should the young horse (under five and one-half years of age) be so used as to avoid developing slight blemishes which may later ruin him.

New horses should not be turned into corrals with old ones until after becoming accustomed to the new surroundings and being in good health and vigor.

Training of Remounts — Preliminary Remarks

The training of a remount should be appropriate to the work he will have to do when taken up for full duty in service. The character of the work to be done by an artillery horse is not the same as that to be done by a cavalry horse; therefore, training appropriate to one is not the best training for the other. This fact, sometimes lost sight of in the army, should be constantly borne in mind. It is not proper to simply regard all horses as service mounts and give them identical training; still less is it proper to take up the artillery horse for full duty without giving him any preparatory training, trusting that he will somehow pick up the training he should have. No commander would think of doing this with a recruit, and neither should he do so with a horse.

The principal work of an artillery horse is draft, and not saddle; but any reasonable training for saddle that he gets will help him in his draft, just as any military training a recruit may receive will help him, whether the training be in his own arm of the service or not, but his best and necessary training must be in his own arm of the service, and so it is with the artillery horse. His saddle training is auxiliary to his draft training, and from the first attention should

be directed toward securing a maximum development of his load-pulling qualities.

The artillery horse occupies an intermediate position between the saddle horse and the draft horse, pure and simple; his work partakes of the nature of each, but he belongs in a distinct class by himself. He, like the cavalry horse, works under the saddle, and therefore must have saddle training; but, unlike the cavalry horse he must not jump, seldom makes abrupt changes of direction at fast gaits, does not need to work on two tracks, etc. In other words, he is less highly trained to obey leg action than is the cavalry horse and, conversely, he gets less assistance from the rider's legs than does the cavalry horse. Consequently, he must be more highly trained for obedience to rein indications.

Again, since about half the horses in a battery carry riders, the animals cannot be regarded as simply draft horses. The average farm or city truck horse hauls a much heavier load than an artillery horse, but he hauls it at a walk; the average carriage horse travels much longer distances at a faster sustained gait than an artillery horse, but his load is lighter. In other words, the draft conditions in the artillery are different from those in civil life.

The demands on the artillery horse are great. He must be a fair saddle horse, under difficult conditions, since he is incumbered by harness, is coupled up with five other horses, and draws a considerable load, all of which affects his movements. He must also be a good draft horse while still acting as a saddle horse and carrying his driver, or as an off horse receiving but little assistance from the driver. He must do his work over broken and difficult terrain of the most varied sort. And, finally, he must be this saddle and draft animal at all gaits.

The demands upon an artillery horse being thus great and of special character, it is evident that they can be met only by systematic training along appropriate lines. The foregoing remarks apply to every horse in a battery, even in a horse battery, for every horse ordinarily used under the saddle must be prepared to take his place in a team in an emergency.

The training, therefore, comprises three periods:

1. Training for saddle.
2. Training for draft.
3. Training for combination of the above.

The first and second periods may be carried on concurrently but independently.

General Principles

As the elementary training of recruits in horsemanship must be accomplished with the aid of trained horses, so must the breaking of untrained animals to saddle and to harness be done by good riders and drivers. The future usefulness of the remounts depends largely upon their elementary training. In any mounted unit the combination of inexperienced men and untrained animals should be inadmissible. Therefore, the interest of the service demands that there shall be developed in each battery a number of men as horse-trainers, not only for the efficiency of the unit itself but also to provide the means for the rapid development of new units. Such men must not only be good riders and drivers, but also good horsemen, familiar with the care, handling, and training of horses. The disposition of the man communicates itself to the horse and reacts favorably or unfavorably as the case may be. Coolness, firmness, good temper, good judgment, and, above all, patience, are the attributes necessary to a successful trainer.

In garrison, horses should receive a thorough training; in the field, they receive such as circumstances permit. But in either case, it must be constantly borne in mind that draft and not saddle

qualifications are of paramount importance.

A horse learns by constant repetition of a lesson coupled with the hope of reward and fear of punishment. The latter must be awarded only with great judgment, the trainer exercising infinite patience in his work. The usual rewards are caresses, either by the voice or touch, a toothsome bit of food (oats, grass, etc.), rests succeeding obedience, dropping reins, relaxing pressure of the legs, dismounting, etc. Persistence in the use of the aids, employment of the spur, harsh tones of the voice, and finally the exceptional use of the whip, are the usual punishments. No definite rules can be laid down. The instructor must be guided by his experience and best judgment, bearing in mind that faults of execution must be rectified with gentleness and patience. Nervous, high-strung horses should never be physically punished.

Most of the movements hereafter described must for a long time be repeated in the same order until the horse is confirmed in his knowledge of the effects of the aids and of the bit by constant repetition. In this way, laborious obedience finally becomes intuitive habit.

Analysis shows that all the desired movements of the horse at all gaits may be obtained by combinations of four elementary actions directed by the rider: (1) to move forward upon pressure of the legs, (2) to diminish the speed or move backward upon tension of the reins, (3) to control the forehand by the reins, and (4) to control the haunches by the rider's legs. When purchased, the horse usually understands the tension of the reins only; the other three actions are rarely understood at the time.

The length of the training necessarily varies with the age of the horse at date of arrival, his previous training, skill of the trainer, and special conditions facilitating or retarding the work.

High spirits in the horse generally indicate good physical condition and lack of sufficient exercise or work. This indication must not be mistaken for viciousness nor subjugated by violent means. Only unsatisfactory results will follow training when horses are not worked enough. Upon such manifestations the horse should at once be given sufficient exercise in some form, or work on the longe, before proceeding further with his training. The opposite extreme of overwork, resulting in dullness, must also be avoided. The number of hours of daily work should be very gradually increased, and the hours of daily drill should be divided into several short periods.

Longeing

Training on the longe is useful both for saddle and for draft. It is a convenient means for exercise, calming nervousness, teaching obedience, suppling the horse, and the best means for imparting balance and sure-footedness. It teaches the young horse to go ahead and to turn. It may be used to teach him to carry his equipment, whether saddle or harness.

The cavesson is placed on the horse's head so that the nose-band will rest in the middle of the lower third of the face inside the cheek-straps of the halter or bridle, and should be buckled fairly tight, so that the nose-band will have almost no play, either sidewise or up-and-down. Care should be taken that the jowel-strap is buckled tight enough to avoid all chance of the outer cheek-strap pulling into the eye. The throat-latch should be loose enough to allow the horse to breathe freely. The longe should be a rope about forty feet long attached to the nose-ring of the cavesson. In teaching the horse to longe, select a smooth place of soft ground where a circle with a diameter of about forty feet can be obtained. Coil the longe in the left hand, leading the horse with the halter shank or the reins of the watering bridle in the right hand, and walk around the circle to the left several times, thus showing the horse the road he is to follow.

Then tie up the halter shank around the horse's neck, being sure to leave no loop hanging, through which the horse could put his foot. An assistant then takes the horse, holding the nose-band of the halter or the cheek-strap of the bridle in the right hand and the rope of the longe about three feet from the cavesson in the left hand. The trainer, with the longe in his left hand, moves about twelve feet toward the center of the circle and somewhat in rear of the assistant at the horse's head, and then clucks to the horse, the assistant at the horse's head leading him forward on the circumference of the circle. The trainer walks on a smaller circle and keeps in a position to the left rear oblique of the horse, thus urging the horse forward. As the horse shows willingness to go forward, the assistant may remove his right hand and slip his left further along the longe and eventually let go entirely and go out of the circle behind the horse. Until the horse is confirmed in going around, the assistant must return to the horse's head and begin all over again at any time the animal ceases to go around.

When the horse does well at either a walk or a trot without the assistance, the animal should be halted and rewarded, either with petting or with a little grain.

The horse is halted by a slight whip cracker motion of the longe, and the command "Whoa," given with decision. If he does not obey promptly at the snap of the longe and the command, give a strong pull on the longe, thus throwing the haunches with a quick movement off the circle and bringing the horse to a standstill.

The horse being at the walk, to increase the gait to the trot command "Trot," in a sharp tone, at the same time walking toward the horse, threatening him with the loose end of the longe or a whip. To bring the horse from the trot to the walk, command "Walk," in a soothing tone, and shake the longe horizontally or resort to a sharp snap of the longe if the horse does not promptly obey.

The horse will soon learn to go out on the circle as soon as given sufficient slack of the rope. When he is halted on the circle he will soon learn to come to the trainer by the command "Come," accompanied by a pull on the longe.

To avoid accidents, the longe should always be coiled and the slack taken up whenever the horse comes nearer to the trainer.

When the horse has become proficient in going to the left, the training should commence in the same manner to the right.

An untrained horse should not be required to go on a small circle until he is suppled enough to do it without great effort. When the horse goes around with effort and leans on the longe, more rope should be paid out and the circle made larger.

One side of the horse is usually "stiffer" than the other, just as most people have less skill with the left than with the right hand and arm. The stiff side of the horse is easily discovered on the longe by the greater difficulty he shows in going around with the stiff side toward the center of the circle. The greater part of the exercise on the longe should be directed toward suppling the stiff side, until both sides are equally supple.

The principal gaits at which a horse should be exercised on the longe are the walk and the trot, and especially should an untrained horse not be required to gallop on a small circle.

Carrying the Saddle and Harness

When the horse, equipped with only the bridle, works freely in either direction on the longe, he should then be longed with a saddle on. Remove the stirrups and straps and put on the saddle leaving the cinch comparatively loose but not so much so as to involve any possibility of the saddle turning. After the horse has been longed for some minutes, the cinch may be tightened. When the horse has thus become accustomed to carrying the saddle, put

on the stirrups and let them dangle.

When accustomed to this, gradually accustom him to the harness in the same way, but avoid allowing the metal collar to bruise his shoulder by continually striking it.

Mounting

When the horse has become accustomed to carrying the saddle and harness, he should be mounted. The assistant holds the coiled longe to within two feet of the nose-band, in his left hand and stands just to the left and facing the horse's head, with the right hand on the reins (which are over the horse's neck) near the bit. The trainer takes the near rein and a lock of the mane in the left hand, pats the saddle, and catches hold of the stirrup. Whenever the horse objects, a slight snap of the longe by the assistant will attract his attention again. If the horse does not resist he should be petted. The trainer, with his back to the assistant, should stand close up to the horse's shoulder, turn the stirrup with the right hand, and insert the foot. If the horse does not object, both reins are taken with the right hand (retaining the left rein running through the hand which had a hold in the mane), catching hold of the pommel, and then lifting the major part of the weight on the arms. If the horse still does not object, the trainer may sit down in the saddle, doing so very quietly. Whenever the horse objects, the trainer should cease until the horse is quieted. If the horse becomes nervous, he should be put on the circle again until he becomes quiet. It must be remembered that the horse's first impressions are the most lasting, and hence the utmost care must be taken in these first lessons.

After the trainer is able to mount repeatedly without startling the horse the assistant may move the horse a few steps by drawing him forward, being sure to maintain the hold on the rein with the right hand, and inducing the horse to walk on a larger circle than he, the assistant, does. In this position the assistant, by pulling the head towards him with the longe, may exercise a powerful control and prevent the horse from making a plunge and thus getting out of hand.

The mounting lesson should be frequently repeated until the horse will carry the rider without trouble. The horse, mounted, being then placed behind a trained horse, will soon be content to follow without being led by the assistant.

Accustoming the Horse to Service Surroundings

The horse should early be accustomed to military sights and sounds, such as troops, colors, bands, bugles, firing, etc. This result is best accomplished by riding a quiet and fearless horse and leading the new one, gradually making him familiar with his new surroundings. In approaching any object the appearance of which frightens the new horse, he should be kept in motion, being led toward the object a short distance and then edged away from it, each time approaching nearer, until he can touch it, if practicable, with his nose, and smell it. He must never be punished for his fear, but should be calmed, as he associates the punishment with the frightening object; nor should he be gotten up to the object by force. His approach must be gradual, and time will frequently be gained by stationing quiet and fearless horses on either side of the frightening object. The same methods apply to accustoming the horse to frightening sounds. In neither case is he afraid of that with which he is familiar. Blank cartridges, gun or revolver, should be fired at some distance from him while he is being led accompanied by one or more quiet, fearless horses. He should then be quieted with the voice and caresses, and the sound repeated at lessening distances. The procedure should be repeated as often as necessary until the

horse reaches the point where standing still and unaccompanied by other horses he is not afraid.

Training for Saddle — To Move Forward

At this stage of the training, nothing does so much good as walks and trots behind trained horses as nearly in a straight line as practicable, thus accustoming the young horse to the feel of the bit and the rider's legs. The trainer should hold a rein in each hand and have only a slight feel on the mouth, giving more rein at any time the horse demands it and then again recovering the feel.

In the lessons of "going ahead" (the most important), the legs of the trainer play the most important part and are used with only the amount of force necessary to gain the amount of go-ahead desired. Trainers must remember that the hand must give whenever a forward movement is demanded by the legs, so as not to ask something with the legs and contradict it with the hand.

The movement ahead is demanded first by even pressure with the upper parts of the calves of the trainer's legs; if that is not sufficient, by taps of the same parts, and then, if necessary by blows of the heels delivered by turning out the toes and striking with the heels just behind the cinch. In early training, when the young horse is found to have dull sides, the spurs can be used with the rowels wrapped with a piece of cloth or leather. Sharp spurs are liable to make kickers or vicious horses. If the horse does not respond to a demand for a forward movement, he can be pulled off his center of balance in place by opening one rein and pulling laterally and then closing that rein and immediately opening the other at the same time acting with both legs and clucking with the tongue. As the horse moves forward, do not continue the leg action or he will not understand what is meant by the demand for a forward movement. During the first lessons, to guide the horse it is only necessary to open the rein wide and pull sufficiently to point the head in the new direction, taking care to maintain enough pressure on the opposite rein to prevent the bit from pulling through the mouth or against the bars. Every day, until the horse is perfectly accustomed to being mounted and shows himself perfectly docile, he should be longed for a few minutes, as much so-called viciousness is nothing more than high spirits. Moreover, no time is lost by longeing, as it aids training in suppling the animal and teaching him to move forward promptly when demanded. Nothing is gained in going further with the training until the horse will go ahead promptly from a halt to a walk and from a walk to a trot by a demand from both legs.

To Decrease the Gait

To decrease the gait, slightly raise the hands and gently pull to the rear by leaning the body back; at the same time, very gradually close in the calves of the legs, and when the gait is reduced to that desired, the hands are lowered and the normal seat resumed. If at any time the rider feels the gait steadily increasing beyond what is desired, the same means for reducing are employed momentarily and repeated several times if necessary until the gait becomes steady. This is called the "half halt." Care must be taken that the horse's mouth is not jerked.

The Trot

Beginning early in the training, the trot should be largely used, as it teaches the horse to go into his bridle, puts him in balance, and develops his muscles. But care must be taken that the trot is not faster than the horse can take without effort. Do not let him go to "hitching."

To Make the Horse Leg-wise

When the horse is in the riding-hall or ring going around the track with his right side toward the center of the ring, he is said to be going "to the right."

If no riding-hall is available, an open-air track, about 300 by 150 feet, should be laid out, on soft level ground, in a location free from distracting noises.

When the horse readily obeys the pressure of both of the trainer's legs he should be taught to obey the pressure of either leg. This will mean obedience of the haunches, which should now be gotten control of.

There are two methods of accomplishing this: One dismounted, and one mounted. The former was generally in use, but is now being superseded by the latter method. The first method:

The trainer, being dismounted, holds the reins near the bit with one hand and lightly taps the horse with the riding-whip back of the girth, thus causing the horse to turn his haunches around the forehand. Care must be taken not to tap him so far to the rear as to cause him to kick. Vary the lesson by using the butt-end of the whip to lightly poke him back of the girth. If he does not yield to the taps and pokes alone, draw his head toward the side on which the whip is applied while continuing the taps and pokes, and as the work progresses gradually lessen the amount the head has to be turned until he will yield, with his head straight to the front. At first be satisfied with a single step, then reward him. Again, vary the lesson by reaching over the horse's back and tapping him with the whip, so as to make him turn his haunches toward the trainer. When the horse turns freely dismounted, mount him, lightly kick him with one heel while keeping the forehand in place with reins, and continue the lessons until he turns by mere pressure of the rider's calf.

The second method:

Going on the track to the right, execute a "right oblique," and after moving a short distance from the track, execute a left about on the forehand made while still marching, causing the haunches to make a larger circle than the forehand, the trainer taking advantage of the natural desire of the green horse to get back on the track, and unconsciously obeying the aids.

The aids to be employed in the turn on the forehand while at the right oblique are the left rein opened and pulled toward the rear and the left leg used vigorously, the right rein used against the neck to regulate the amount of its curvature to the left and to stop the right shoulder from running too far to the right while the horse is swinging around.

As soon as the horse's head is pointed toward the track on the same oblique line as that on which he left it, the movement straight ahead is demanded. Leaving the track on a left oblique, the aids to be employed are the opposite of those described above.

Half Turn on the Forehand

This may be taught by either of the preceding methods; but good horsemen now discourage the abouts in place (not marching) except with a hot-headed horse tending to rush ahead.

Haunches In

When the horse has learned to readily obey the pressure of either leg of the trainer in (as above) half turns on the forehand, the suppling of the haunches can be continued on the track by the movement "haunches in." This movement is nothing more than a bend of the haunches toward the center of the riding track so that

the inside fore foot and the outside hind foot will track in a straight line.

Marching on the track to the right, the method to be employed is as follows: Open the left rein with a light pull to the rear and apply the leg on the same side with enough force to move the haunches toward the inside of the track. The right rein is pressed against the neck so as to limit its curvature. The fore legs should continue their march straight to the front and not cross. In the beginning of training, the moment the trainer feels the least yielding of the haunches in obedience to the leg, the horse should be straightened. He is straightened by the reins bringing the head to the normal position and the inside leg pushing the haunches over. The horse soon learns to advance some distance in the position of "haunches in."

The Gallop

After the horse understands "haunches in" he should be taught the gallop, as this is a gait which extends his muscles and gives him balance. To gallop without danger of falling he must lead with the inside fore and hind legs. A horse leans his haunches toward the side on which he is leading with the fore leg; therefore, the position of "haunches in" places him in position to gallop with the lead on the side to which the haunches are inclined. (The shoulder on the inside and the hind leg on the inside are both pushed farther to the front.)

To secure a desired gallop lead, proceed as follows: The horse will be moved around a large circle at a trot which will be extended, and just before the trainer feels that the horse is about to break into the gallop the aids as indicated for "haunches in" will be applied so strongly as to push the horse into the gallop. The trainer must remember that his weight should be placed directly over the outside hind leg, and that his body should not be pitched forward but must retain its vertical position with the back supple. The gallop lead can be maintained by returning at any time to the position of the aids as in "haunches in." The horse at the gallop making a turn must be supported by the inside rein against the neck, the inside leg over the cinch and the outside leg well behind the cinch and the rider sitting vertical and not leaning in or forward.

Every horse has one lead which he prefers, and he should be drilled on the side on which he does not desire to gallop until he will take one lead as readily as the other. At the gallop, the horse should be given as long a rein as he demands, so that he can use his neck to balance himself in the rocking motion of the gait; but, at the same time, a gentle feel on the mouth should always be maintained.

Trainers should select soft ground on which to gallop, and never hard ground. The gallop, like all other lessons, should not be continued until the horse is fatigued. It is well to cease any lesson after the horse has responded willingly to any new demand made upon him, thus leaving him with a pleasant impression of his work, from which he will grow to like it and not to dread it.

Shoulder In

It is as necessary to supple the shoulders of a horse as it is to supple the haunches, because the horse in all his turnings must bend his shoulders and move them laterally. The best movement to supple the shoulders is the movement, "shoulder in," and it is obtained as follows:

The horse is put on a small circle at a walk and allowed to relax. The trainer then, without contraction, opens the inside rein and leads the shoulder off the track he is following, just enough to cause the outside fore foot and the inside hind foot to track on the

circumference of the circle. At that moment the trainer should carry the inside rein toward the withers, maintaining a slight bend in the neck with the horse's head in, the outside rein pressed against the curve in the neck so as to keep the shoulders from swinging out, and at the same time the trainer must press the horse forward with both legs, the inside one used the stronger and just at the cinch, and the outside leg used farther back to prevent the haunches from swinging out. The horse will thus make a circle in which the haunches describe a slightly larger circle than the forehand, and the horse's neck is bent so that, to a limited extent, he is looking toward the center of the circle. After the horse learns this movement on the circle, he should be taken off on a tangent for a few steps. He soon learns this movement, and there is no better suppler for the shoulders, the neck, and the jaw.

This movement is exactly the reverse of "haunches in." In "haunches in" the front feet of the horse stay on the track and the haunches are inclined to the inside of the track. In "shoulders in" the hind feet are left on the track and the shoulders and head and neck are inclined to the inside of the track.

Half Turn on the Haunches

The horse is now ready to be taught the "half turn on the haunches," which is nothing more than an about on the haunches while marching, and is a movement in which the shoulders make a larger circle than the hind quarters. As in the turns on the forehand, horsemen prefer to teach this movement while moving rather than while keeping the horse in place, to avoid losing the "go ahead."

This movement is most easily obtained by executing a flank movement on the haunches and then, after marching a short distance in this position, executing another flank movement on the haunches, gradually cutting down the distance that the horse moves ahead until the two flank movements are combined and the "half turn on the haunches" is the result.

Marching on the track to the right to execute a flank movement to the right on the haunches, slightly raise the hands, open the right rein, pulling laterally and leading the head to the right, pressing gradually the left rein against the neck not far from the withers and closing in the left leg behind the cinch. The weight of the trainer's body is carried slightly to the rear and right. The right leg remains hanging naturally. After the two flank movements are united in the "half turn," on the haunches and executed without effort, the circle described by the haunches may be gradually decreased in size. Haunch movements are not only excellent as a suppling means, but also in making quick turns they are largely used by the horse himself to preserve his balance.

Change of Lead

After the horse gallops at one lead as readily as at the other, the trainer can begin to train for the change of lead. While galloping to the right on the track, for example, the trainer will gallop around both turns at the end of the track and immediately after the second turn will change direction so as to follow the diagonal of the riding track and when two-thirds through the diagonal he will come to a trot and just before he enters the first turn at the end of the diagonal he will take the opposite or left lead of the gallop. He will then gallop around the four turns and immediately after the fourth turn leave the track and go across the riding track on the other diagonal, coming down to a trot as before and taking the opposite lead at the end of the diagonal. The distance at the trot can be very gradually cut down until it disappears entirely and the change of lead made just before entering the turn at the end of the diagonal.

It must be remembered that the weight of the rider should be carried over the hind leg opposite to the lead at a gallop, and the croup should be held, by the leg of the rider, slightly inclined to the side of the lead. As a consequence, at the moment that the change is demanded the weight is shifted and the croup is pushed over toward the side of the new lead. For example: At a gallop with right lead, the weight is over the left hind leg of the horse, and the left leg of the rider inclines the croup towards the right. As a consequence, when the change of lead to the left is desired, the moment it is demanded the weight is shifted over on the right hind leg of the horse, and the croup is pushed over to the left with the rider right leg.

To Passage

This should not be attempted until the horse obeys the reins and legs fairly well. It is best taught in the riding-hall, or at the gun shed, or in some building.

To passage to the right (left) — Ride obliquely toward the wall from the left, and just before reaching it, where the horse would change direction to the right in order to move along the wall, the trainer, controlling the forehand with the reins, closes his legs, the left one farther back and with greater pressure, and moves the haunches to the right. At first, be satisfied with a slight displacement of the haunches for a few steps only, and then move off parallel to the wall. Ride away from the wall and approach it as before. Each time that the wall is approached, increase the displacement of the haunches, until finally the horse moves along the wall, his body almost at right angles to it, the forehand slightly in advance of the haunches and his head and neck in prolongation of his body. The movement to the left is similarly taught, approaching the wall from the right, and displacing the haunches toward the left.

Another method of teaching this movement is with the assistance of a dismounted man. The horse is placed with his rump toward the wall. The rider uses his reins and legs to move the horse sideways while the dismounted assistant reinforces their efforts by holding the cheek-piece of the bridle in one hand and shoving the forehand, while at the same time he taps the horse back of the girth with a whip to move the haunches.

Suppling and Flexions

The suppling of the horse's body in all parts should constantly be the trainer's aim, and the preceding movements will accomplish that result. The suppling of the jaw and the flexions should be postponed to the last part of training. It is better to begin them too late than too early.

Right lateral flexions — Having the horse trained to go promptly against his bit at the demand of the legs, and while moving at a walk on the track to the right, demand the following flexion of the neck and jaw: Open the right rein until the horse brings his nose to the right on a line which comes out of the right shoulder and which is parallel to the axis of the horse, press the left rein against the middle of the neck to limit the neck-bending to the right, and the moment the position desired is obtained carry the hands low and toward the left hip and remain so until the jaw on the right gives, then return the hands and reins to their normal position. Both legs act to push the horse straight ahead during this flexion. The left flexion is given on the track to the left with the opposite aids.

Backing

This exercise should also be reserved for the end of the training, except for a very hot horse, as the movement is opposed to the

forward one which is the great object in all the other exercises.

To back, the following means should be used: Slightly raise the hands, incline the shoulders to the rear very slightly, pull progressively and equally on both reins; the moment the horse gives a step, give the hands, and then repeat as above for each step backward. Back a few steps, and then immediately demand the forward movement with both legs, thus leaving the forward movement the last impression received by the green horse. If the horse "stilts" on the hind legs and refuses to move back, push the haunches a step to one side with one leg and then back a step before the horse has a chance to set himself again, then push the haunch in the other direction and back a step, and continue this until you can back straight.

The Double Bridle

All the training thus far has been in the snaffle bit; but if it is found that the horse begins to pull too much in the snaffle for his thorough control, it is time to put on the double bridle. This bridle should be adjusted very carefully and inspected often by the instructor. The snaffle or bridoon rests in the corner of the lips, and the curb rests just under the bridoon rings. In adjusting the bridle, the mouth should be opened to see that the bridoon mouth-piece rests just above the mouth-piece of the curb. The curb bit should be used at first without a curb chain until the horse becomes accustomed to the two mouth-pieces; subsequently, when the chain is used and finally adjusted, it should pass underneath the bridoon and rest perfectly flat in the chin groove. The curb bit adjusted with the curb chain should fall back at an angle of about forty-five degrees when pressure is put on the curb-bit rings.

When with the double bridle the reins are held in both hands, the snaffle-rein should come into the hand underneath the little finger and both come out between the thumb and forefinger. When the double reins are held in one hand, the snaffle reins should be on the outside and the curb reins on the inside, each one separated by a finger, and all coming out of the hand together between the thumb and forefinger.

There are other ways of holding the reins that are equally good.

The course of training may be carried as far as desired, the methods of accomplishing which are given in equitation manuals.

Bending lessons — The double bridle is especially useful in securing proper carriage of the head and neck. Every effort should be made to get the bend in the neck at the poll and not near the withers. The trainer is dismounted and with his left hand holds both snaffle reins a few inches in front and above the horse's nose while playing the curb reins held in his right hand a few inches back of the jaw. The horse must stand squarely on his legs and must not be allowed to back. Great patience is necessary, the slightest yielding of the muscles being awarded by caressing the horse. The lesson should be continued only a few minutes at a time.

When the horse obeys the rider dismounted, the lesson should be given mounted, the rider holding up the head with the snaffle reins and playing the curb reins lower down. The lesson should ultimately be given with the horse in motion.

Bending lessons by turning the neck sidewise should not be given. They make a "rubberneck."

Gaits

The horse should be confirmed in the three regulation gaits walk, trot, and gallop, which are at the rates of 4, 8, and 12 miles, respectively, per hour.

To confirm a horse in the regulation rates of speed requires much

time and patience. Stakes should be driven at some convenient place daily passed over, every 117 1-3 yards apart, and numbered consecutively. The horse at the prescribed gait passes in one minute at a walk over one, at a trot over two, and at a gallop over three staked spaces. The new horse is best confirmed in these gaits by going over the above-described course, having him in harness with well-gaited horses.

Training for Draft

The object is, to train the horses so that when harnessed in any position in the team they will move the carriage fully equipped and loaded with ammunition over any terrain practicable for artillery and be at all times and under all circumstances under perfect control of the drivers.

After the horse has become accustomed to carrying the saddle and does not object to being ridden, his training for draft should be begun.

He may first be accustomed to the harness while he is in his stall, allowing him to smell it, putting on part of it, then removing it, proceeding gradually so as not to frighten him.

If difficulty is anticipated, he may first be longed with the saddle and bridle on, or ridden, and then harnessed while still on the longe. In the early lessons care must be taken that the traces do not frighten him by continually striking his sides, nor should they hang so as to entangle his legs.

It is preferable to use a wheel harness in all early lessons, as this accustoms the horse to the breeching, and in addition the traces can better be held up. Neither traces nor side-straps should be allowed to hang down from the breeching.

The harnessed horse, unattached to a vehicle, should not be driven at a trot long enough for the metal collar to bruise his shoulders or make them sore.

As the only bit that newly-purchased horses are accustomed to is the snaffle, they should invariably be worked in this bit.

Elementary Training

To teach the horse to draw a load, he should be led or longed while a man holds ropes or pieces of sash-cord that have previously been attached to the traces so as to prolong them, beyond the reach of the horse's heels if he kicks. These long traces will also prevent his wheeling around.

As the horse moves forward, the man, following at the end of the traces, gradually holds back on them. If the horse halts, his confidence must be restored before again starting (with no pull the traces), and less tension should be used. He will soon learn pull well, after which a second man may be added at the end of the traces.

In this exercise the horse should be urged forward by the voice and not with the whip. All violent, sudden movements should be avoided.

At the end of a few days he will work well without any carriage and should then be attached to a vehicle with other horses.

Regular Training

When placed in a team the horse should first be used as off swing in a well-broken team, and if he does not at first pull he should be allowed to trail along. All sudden or violent movements of the driver that would cause the horse to jump against his collar should be carefully avoided or the horse will bruise his shoulders and always fear the collar.

When he has become accustomed to his surroundings and

manifests a willingness to pull his share of the load as an off swing horse, he should be changed to some other position in the team. all this training, a caisson without ammunition should, if practicable be used, and on level ground only.

The horse should now be moved over comparatively long stretches, so as to harden his shoulders, which must be carefully watched so as not to allow them to become sore.

When a horse works freely in any position in the team with empty caisson on level ground, the difficulty of draft should be creased by gradually increasing the pressure of the brakes or load on the caisson. This training should be followed by work over more difficult terrain.

Particular attention should be devoted to steep ascents, but care must be taken to avoid giving the horse tasks beyond his ability and especially is this so with spirited horses which may easily through errors of the trainer's judgment be made into balkers and thus ruined.

In going up steep ascents the horses should move slowly pull steadily. To rush teams up steep ascents is pernicious harmful.

All difficult tasks should be approached quietly, the driver fraining from any unnecessary movement, noise, or excitement.

Horses when drawing well should never be struck with the whip. If they manifest a disposition to quit they may be threatened at the particular instant of stopping. They should not be allowed to jump against the collar, as this bruises the shoulders.

The load should be moved by the united, simultaneous action of all the horses quietly working together.

A horse in heavy draft requires a firm support on the reins. This is especially the case when the footing is at all precarious.

Artillery horses should not be taught to jump, as by jumping over an obstacle a team horse generally bruises his shoulders, and, as the horses of the team do not jump together, each one, as he in turn comes against the collar, attempts alone to move the entire

load.

As a rule, shallow ditches, ridges, etc., should be approached at right angles, as when passed through or over obliquely there is not only the possibility of upsetting the limber but in addition the pole is thrown sidewise and disturbs the balance or footing of the wheel pair.

The new horse, harnessed in a well-broken team, is first driven through or over obstructions without being hitched to any vehicle. When he passes the obstruction without altering his gait, the team is harnessed to an empty caisson, and when he works well here the resistance is increased gradually.

The most difficult haul is up a steep side-hill where the carriage slews. Here the team must be kept pointed obliquely toward the crest of the hill to such an extent as to prevent the carriage from slewing out of the road.

In all cases where not all of the horses of a team have good footing at the same time, such as in passing ditches, low walls, mudholes, etc., drivers whose pairs have good footing must make special efforts to keep the carriage moving until all secure a footing.

Assignments After Training

As a general principle, horses under seven years of age should habitually be employed as off horses; but they should be trained to work in any position in the team, or as individual saddle horses.

Other guiding suggestions: The heaviest and strongest horses should be placed in the wheel pair on account of the extra work of this pair in turning the carriage and holding it back on down grades. In any pair, the horse of the best saddle conformation and most durability should be the near horse, and the freest mover should be the off one. If both are of the same disposition and similar conformation they will work in better harmony.

INSTRUCTION OF SCOUTS AND AGENTS

BY 1ST LIEUTENANT CORTLANDT PARKER, 6TH FIELD ARTILLERY, U. S. ARMY

The instruction received by scouts and that by agents is identical. Besides instruction in signal and telephone duties it should embrace the following:

1. The use of field glasses, and the use of B. C. ruler and hand in measuring angular distances in mils.
2. Orientation.
3. Map reading.
4. Sketching.
5. Making written and verbal reports.
6. Instruction in the service of:
 - a. Ground scouts;
 - b. Route markers;
 - c. Position reconnaissance;
 - d. Security;
 - e. Observation of the battlefield;
 - f. Observation of fire;
 - g. Reconnaissance of targets.
7. Duties of courier.

The Use of Field Glasses

Service glasses are used in this instruction. Each man is taught to focus a pair of glasses and describe minutely what he sees in a limited portion of the terrain. The instructor checks all observations with his own field glasses.

The Use of the B. C. Ruler and Hand in Measuring Angular Distances in Miles

In this instruction it is not desired that the personnel be taught to measure deflection for the guns, but that each man be able to measure the angular distance between two objects in his from This instruction finds its application in the service of observation of the battlefield, in the service of observation of fire, and in the service of reconnaissance of targets.

The letter T at one end of the ruler, and the figures 61, 62 and 63, and the figures 0, 1, and 2 in heavy letters are disregarded. Attention is called to the fact that the scale runs from left to right on top of the ruler and from right to left on the bottom of the ruler. The knot on the string is previously adjusted by the instructor and the men are taught to hold the knot against the cheek bone under the eye, and to measure angular distances of one object from another, i. e. "one object is so many miles to the right or left of another."

The hands of the men are then calibrated. For this purpose the instructor, using a B. C. telescope, causes white stakes about six feet high to be set up about 200 yards from the telescope, on a line normal to the line joining the stake and the telescope. There should be 100 mils between the two left stakes and 5 mils between the remainder of the stakes to the right. These latter should number about eight. The men are cautioned to extend the arm to the limit, back of hand toward the face, tips of fingers up, palm verical, and

in that position measure the front covered by their four fingers along the line of stakes. On a piece of paper are noted the following:

Width of finger at second jointmils
Width of four fingers at second joint.....mils
Width of thumbmils

This data is preserved to be pasted in the men's notebooks.

The hand being calibrated each man is required to measure angular distances as before, using handbreadths as a unit, then to measure angular distances with his hand and give the result in mils.

Orientation

For this instruction the men are assembled in a room and the instructor draws diagrams on a blackboard illustrating his remarks.

The instructor explains what the cardinal points are and teaches the men the names of the intermediate points. The instructor draws on the board a diagram of the North Star, the Big Dipper, and Cassiopeia.

At the first convenient opportunity the men are taken outdoors and required to practice the three methods of orienting themselves—by compass, sun and watch (or sun alone), and the stars, as explained in books on map reading.

Map Reading

The men are taught the meaning of the word map and the difference between a geographical and a topographical map, and what the scale of a map is. It is explained that in making a topographical map two things are required, viz.: (1) representing the shape of the surface of the ground; (2) representing the objects, natural and artificial, that are on the surface of the ground. To teach the men to recognize on the map the objects, natural and artificial, on the surface of the ground, they are required to make copies of the authorized conventional signs until they can recognize any of them.

To teach men to recognize the shape of the surface of the ground, they must, of course, be taught the meaning of the contours, A rational explanation for the use of contours, to a beginner, is to state this: That the shape of the ground may be represented by covering the map with points and by placing opposite each point its elevation in feet, but that this is inconvenient as it covers the map with figures and, moreover, the shape of the ground is recognized with difficulty. Therefore the method of joining on a line all points of the same altitude was adopted.

Then hill forms, valleys forms and all topographical forms are illustrated by sketches until a contoured map is legible to the men. A sand box may be used also. Finally the men are taught to deduce the grade of a road from an examination of the map.

The instructor should provide himself with a dozen or so different sheets from the Geological Survey, and with a like number of the maps of the military reservation. These should be constantly referred to in the instruction. The men are taken indoors and are given exercises in the following, using the maps:

1. Orienting the map:
 - a. Knowing the position of the cardinal points;
 - b. Not knowing them, but knowing the position occupied, ground and map.
2. Finding the point on the map which you occupy on the ground.
3. Study of the terrain around a point, being oriented and located.
4. Following a route indicated on the map.
5. To make a rapid sketch from a map.

6. Then, without their maps, to follow a route indicated on the map, previously committing to memory the route as indicated on the map.

Sketching

Instruction in sketching should conform to the methods specified in text books on the subject authorized by the War Department. Proficiency in the use of the service sketching case is required. The men are required to sketch dismounted first, having previously made a suitable scale. Then sketching mounted is taught.

After the instruction in sketching is fairly on its way, the instruction in map reading is repeated. Many things not previously understood by the men, will then become clear to them.

Instruction in Making Reports, Written and Verbal

This instruction should be left to the last. The instructor requires the scout to ride over certain country and make a written or verbal report, as desired. He may also require the scout to submit a sketch of the same.

The artillery commander may or may not specify the particular points on which he wishes to be informed. Therefore, the scout should be able to make a report giving all desirable information on the terrain reconnoitered. The features to be reported on may be the following:

1. A road; 2, a railroad; 3, a water course; 4, a swamp or marsh; 5, a wood; 6, a habited place.

In order that the scout may overlook nothing of importance concerning these features his notebook is provided with the following reminders, which he should read over before he leaves on his duty and during the performance of it, making appropriate notes in his notebook.

1. Report on a road:

General direction
Total distance observed
Material of the road: earth, macadamized, sandy,
Condition of the road: dry, boggy, cut with deep ruts, rocky,
smooth, solid roadbed, or soaked through and slippery.
Widths: Artillery can go in section column, in double section.
Grade: Artillery can travel over it, or cannot.
Gaits: Artillery can trot over it, or cannot trot over it, or may
trot only between and etc.
Defiles: At (such and such) bridges, railroad crossing, or
passages through towns, or at (such) an obstacle in the road.
Country alongside the road: The road is mostly cut, fill, or
surface. Fences, what kind, generally, and how far along
road.

Artillery can or cannot leave road.
If it can at points.
Neighboring country practicable or not for
artillery.

Nature of the surrounding country: Crops, meadowland,
woods, waste lands, or marshes.

Water: Where best obtainable along road, and for how
many animals at once?

Miscellaneous: Supposing the enemy to be located at
....., the road is concealed from the enemy from
..... to.....

2. A railroad:

Number of tracks.

Length of railroad observed.

Location and extent of cuts and fills and whether they are

passable or not for artillery.

Grade crossings on the road from to

3. A watercourse:

Length of watercourse observed. Average width and average depth. Strength of current: slow, swift, rushing.

Bottom: mud, quicksand, hard, rocky.

Banks: Vertical, high, low, of crumbling earth, hard or wooded.

River can be crossed on pontoon, trestle bridge, ferry.

Bridges are located at Of these the following are not practicable for artillery:

Fordable generally, or not.

Fords located at Of these the following are not practicable for artillery:

Obstacles are or are not placed in the fords.

The ice is inches thick.

4. A swamp or marsh:

Length and width.

Average depth of water.

Nature of bottom.

Location of fords.

Location of roads through swamp.

5. A habited place:

Number of inhabitants.

Number of stores and places of supply for men and horses.

Ways of passing through town.

General Remarks on the Use of Scouts and Agents with Artillery Commands

Whenever the enemy is known to be near, scouts must perform their duties with great caution, not for the sake of their own safety, but for the sake of concealment for our guns. The scouts should attempt to get all possible information and report it, but he must remember that the enemy is trying just as hard to find out what is going on over on our side. The appearance of horsemen on a crest coming and going may reveal the presence of batteries which are coming into position. This galloping around and exposure of scouts on a crest may have the gravest consequence not because the scouts may be hit but because it shows the enemy where our guns are going into position. Scouts and agents work in pairs whenever possible. On arriving near a crest both dismount behind the crest and one proceeds forward cautiously, alone, on foot and looks over the crest. Scouts and agents must remember that the work required of their horses is most hard, and that therefore they must save their horse's strength and avoid useless galloping about.

Agents march in rear of the staff of the officer to whom assigned in alphabetical order of batteries, right to left. When at a distance from the enemy scouts may march with the sections to which they are assigned. When they are needed, the direction is given, "Scouts report to —," or "Scouts of — Battery report to —," after which they fall-in in column of twos in rear of the agents, alphabetical order, front to rear.

It is understood that the scout ought to be of intelligence superior to the average enlisted man. In addition to this, he must always be attentive to what is going on about him, and especially must he be always oriented and always able to retrace a route passed over.

Instruction in the Service of Ground Scouts

This service has for its object the timely warning of the existence of obstacles and the ways of passing them, the guidance of the command on the right road through all turnings, and the guidance

of the command through towns. This service is distinct from that of "marking the route" to be described below. The service of ground scouts is appropriately used when the command is marching off the road across country. It may also be used when marching over a road, if required. The fundamental rules for its execution are as follows:

1. The personnel engaged in this service must be able to see ahead further than the officer conducting the march of the column.

2. Each man engaged in this service must be able to see, at all times, both the man ahead of him and the man following him.

The officer conducting the march or his adjutant designates a non-commissioned officer to supervise the service of the ground scouts, designates the scouts to be used, who should not exceed two or three in number, and gives the command "Ground Scouts Out." At this command the non-commissioned officer conducts his scouts on the route to be followed, leaves one of them in sight of the officer at the head of the column, and proceeds on. The non-commissioned officer arranges the scouts as required by the principles above and is himself accompanied by the last scout. When he arrives at an obstacle he places his scout at the obstacle with direction to the guns for passing it, and moves on. The scout next the column halts at the obstacle, informs the officer conducting the march in time to avoid halting the column and moves on, when directed. If there is an obstacle whose passage will involve a change of formation, as from line into column, timely warning must be given.

Instruction in the service of ground scouts is carried on outdoors over a varied terrain.

Instruction in the Service of Route Markers

See par. 682, F. A. D. R., 1908.

A good method of marking the route is as follows: The scouts are numbered and the officers conducting the service of route markers start out, followed by the scouts. Having arrived at a point where a marker is required, the officer posts No. 1, and proceeds, followed by the remaining scouts. No. 1 observes the direction taken by the officer and his scouts. Nos. 2, 3, etc., are posted in succession where required. When the column reaches No. 1 he shows to the officer conducting the column the direction to follow and taking an increased gait over that of the column moves on to No. 2's station, of whom he inquires the route to No. 3, whence he proceeds to No. 4, and so on. Having arrived at the post of the highest numbered scout, No. 1 is posted again, or not, as circumstances require. Likewise No. 2 having directed the column on to the post of No. 3 takes the increased gait and follows No. 1, to be posted beyond No. 1, if necessary. This operation goes on as long as desired. Great economy in the use of these scouts may be obtained by messages left with a scout such as to stay on a particular road until directed off of it, etc. If the officer conducting the service of route markers finds himself finally left without scouts, he may request the officer whose route he is marking to let him use the agents. If this is not practicable, the officer conducting the service of route markers may proceed with the officer whose route he is marking until the latter arrives at his destination, first directing the last man posted to stop at his post all scouts coming up and also the column. When the destination is reached the officer conducting the service of route markers returns to the last scout posted and, if the column has reached that scout, guides the column to its destination. If the column has not reached the last scout posted, the officer continues the marking of the route.

Instruction in marking the route will be carried on outdoors an individual man being used to represent the head of the column.

Instruction in the Service of Position Reconnaissance

Remarks.—This service has for its object the supplementing, by enlisted personnel, of the work of the reconnaissance officer. It will frequently be the case, in a cultivated and fenced in country that a reconnaissance officer will not, at first sight, be able to select positions for all the guns of a command, and that time will not permit a proper reconnaissance by one person.

Method of Instruction

The Instruction is Carried On Indoors and Outdoors

For the indoor instruction the instructor, by a diagram on the blackboard of a vertical section of terrain, explains what an "open position" is, and shows the positions of "slight defilade," "dismounted defilade," "mounted defilade," and "flash defilade." He instructs the men in the method of obtaining the last. He cautions them that the slope from crest to guns must not be too abrupt; otherwise the guns will not clear the crest. A diagram is also drawn of a "counterslope position," or a position on ground sloping toward the enemy, but defiladed from him by another rise in front.

He then instructs the men in the meaning of the terms "position for immediate action," "position of observation," and "position in readiness" (p. 110, F. A. D. R., 1908), and follows this by the explanation of the composition of a battery on a peace footing and on a war footing (pp. 192 and 193, F. A. D. R., 1908), and shows by a diagram the front in yards of a battery, battalion, and regiment in action. He instructs the men in the nature of positions desired for limbers, reserves, and train—not too far from the guns for resupply of ammunition and replacement of casualties and promptitude in limbering up, but still distant enough for concealment from the enemy and comparative safety from projectiles intended for the guns.

It is explained that if the defilade is taken against a battery which has a grove of trees in its rear, this defilade against the battery will not hold good against a hostile scout posted in one of the trees; also that if our battery takes a defiladed position on a rounded hill against a hostile battery in its front, this defilade will not hold good against a hostile observer posted considerably on the flank of the hostile battery. On account of these facts, it is directed that in selecting a position its defilade against any position possible of occupation by the enemy be noticed, as well as its defilade against the positions where the enemy is known to be. This completes the indoor instruction in the position reconnaissance.

The outdoor instruction will consist in the actual selection of positions by enlisted men. A tactical situation, including a position and strength for the hostile batteries, is assumed and scouts are sent out in pairs in a limited portion of the terrain to find positions, to report on the number of guns which may be placed therein at normal intervals, the maximum useful defilade obtainable against the hostile batteries, and the defilade of our guns when posted there against other positions possible of occupation by the enemy.

The scouts also report on the location of posts for limbers and reserve and concealed routes whereby the position may be occupied. In each case the scouts are given a fair time limit in which to reach and reconnoitre the position, return and report, but an indefinite time is never permitted.

NOTE.—The officer conducting these exercises should, by a study of the map, or, if necessary, by actual examination of the ground, have prepared several good tactical problems before the personnel report to him, and should, himself, have already solved the problems to the men under instruction. Haphazard problems

and critiques are of no value. A study of "des Exercices de Service en Campagne," by Aubrat, will be of value to an officer conducting these problems and all other outdoor work with the personnel.

The Service of Security

Instruction in this service is carried on outdoors by the instructor, a special tactical situation being assumed by him and communicated to his scouts.

Remarks.—In the normal case, field artillery will be accompanied by the other arms and on the other arms will rest the duties connected with the service of security. But when the artillery advances beyond the bulk of the main body to take position, the amount of protection it may receive at this time diminishes and artillery commanders will take their own precautions. Likewise when having engaged the enemy a change of position is ordered, the artillery is threatened with chance encounters with small bodies and with danger from concealed sharpshooters. It must be remembered that one draft horse shot down when the column is moving on a narrow road, especially at increased gaits, will create a confusion which will materially delay the occupation of a position. To provide for the security of the march of the artillery in either case (an advance to position, or a change of position) the officer commanding the moving column causes to be organized a service of security to fit the particular needs of the case, and this, too, with the use of the least possible members. The great desideratum is timely warning of a danger. To this end advanced guards, rear guards, flank guards, and patrols, all of comparatively small force, may be employed. They must see as far as possible and at the same time have means of almost instant communication by means of prearranged signals (see last three lines, par. 675, F. A. D. R., 1908) with the artillery column. If the route is being marked the personnel engaged in that service may be of assistance in the service of security.

When the artillery is in position and receives the protection of the other arms the service of security will generally be properly executed if a scout is placed on each flank of the isolated group to observe and report on the movements of the enemy. But when the artillery is in position and the other arms are not affording protection, as when an advance to a position is made ahead of the bulk of the main body, the officer in command of the group causes a service of security to be organized. Scouts are posted to the front and flanks to give timely warning of the approach of the enemy. The officer posting these scouts considers every avenue of approach open to the enemy, what means of escape of resistance our guns have, how long a time may pass before assistance from the other arms may be expected, and then posts his scouts in the best possible manner for the purpose of timely warning. He notifies the scouts of their particular and general duties and of his post, selected as near the guns as possible, and visible to the scouts, if possible, so that visual signals may be used. If a visual signal of danger is impracticable scouts are posted in pairs and messages are delivered by gallopers.

The Service of Observation of the Battlefield

Method of Instruction.—To train scouts to observe the battlefield they must first know how to describe in a few words what they see, then to locate what they see to another person's eye with considerable accuracy.

To teach scouts to explain in a few words what they see their military vocabulary and general knowledge must be increased. To this end explanation is made of the infantry attack, illustrating by diagrams on a blackboard. The tactics of cavalry, especially the process of dismounting to fight on foot, the normal charge, and

charge as foragers, are explained. A description of the numbers, size and appearance of large units of cavalry and infantry is given, with the appearance of an advance guard. The scout is made familiar with the range of the rifle and the sound of a machine gun in action.

To teach scouts to locate what they see to another person's eye the instructor follows the principles of Pars. 455-458, F. A. D. R., 1908. To designate the position of a target which has an appreciable front the scout is taught to locate a prominent object, as explained in paragraphs referred to. From this prominent object to locate the flank of the target nearer the prominent object, then to state the front.

Thus, "To our right front, on the skyline, a farm house surrounded by evergreens.

"250 miles to the left of the farm house and on the skyline, a windmill.

"40 miles to the left of the windmill and concealed behind the crest of the skyline, a battery of six guns.

"Front of the battery, 40 miles."

Instruction may be begun indoors and use made of the terrain board. The scout is taught to locate to the instructor's eye an object on the board placed there by some third person. This instruction is repeated from time to time outdoors, the instructor requiring the scout to locate to a third person some object on the landscape.

Instruction in the Observation of Fire

The best means of instruction is the actual observation of fire. Scouts and agents of the element not firing should be required to attend and fill in a report similar to that required of officers shown below, the report to be turned in to their instructor. Previous to observing fire the men should be taught as much of the Rules of Fire (Pars. 387-413) and Observation of Fire (Pars. 359-386) as the instructor is capable of teaching. In this connection it may be mentioned that readings from the Drill Regulations on such a subject mean nothing to the average man, and the instructor must put things in a homely and simple vocabulary.

Report of observation of firing by battery

..... 19
(date)

Range		Burst		Over or short	Deviation in miles	Remarks
Ordered by Battery Com.	Observer's estimate	No. in air. Height in miles	No. on graze			

Respectfully submitted,

.....
.....th Field Artillery.

Instruction in the Service of Reconnaissance of Targets

The instruction is best carried on outdoors with an assumed

tactical situation. The problem will generally consist in reporting on the strength, position, surrounding topography, etc., of hostile artillery which may be either completely defiladed against us, have mounted defilade or any of the other defilades. The hostile artillery is represented by some objects, preferably mobile artillery targets O and P, and the scouts are confined to a limited portion of the terrain. It is explained that the map will often help to show where a view may be obtained of the hostile defiladed batteries whose general direction only is known.

NOTE.—If a battery whose flashes are visible can be located on a map, and the examination of the map indicates that there can be but one crest concealing that battery, the hostile battery is fairly vulnerable, for—

Flash defilade is 4 yards.

The slope of most hills is not more gradual than one-tenth.

Therefore the battery must be within at least 40 yards of the crest or thereabouts.

If we range on the crest and go back in increments of 25 yards, taking 3 such increments, the battery should surely be within the area searched.

The Duties of Couriers

See Par. 681, F. A. D. R., 1908.

A convenient method of instructing the men to learn and deliver verbal messages is the following: The men are arranged on the circumference of a circle of large radius, with 15 yards between adjacent men. The instructor goes to one man, gives him verbally the message, which the man repeats to the instructor; then accompanied by the instructor, he delivers the message to the next man, and so on. The message goes around the circle in this way and, if no error has been made the instructor waits until the message goes around, announces the original message and the message as finally delivered and tells who made the first error.

Before assuming their duties with batteries, scouts and agents should be equipped with a pair of field glasses and a compass (the two preferably combined), a watch, a pencil and a notebook. They should also have a pocket knife and wire rippers. In his notebook the scout should leave posted the memoranda referred to above, and besides other useful data such as the Myer code, etc., etc.

THE COOPERATION OF THE ARMS IN BATTLE

[Translated from Beiheft 117 zur Internationalen Revue uber die gesamten Armeen und Flotten, April, 1910, by Captain Oliver L. Spaulding Jr., 6th Field Artillery.]

In maneuvers, large and small, in militia lectures and discussions, and in professional publications of all kinds, the point most strongly emphasized of late is the necessity for cooperation of all arms, and more especially of the infantry and artillery. The more one studies military history the more is one impressed with this lesson.

The modern principles for the use of artillery were first laid down and applied by Napoleon, as is shown by Lieutenant Bircher in an excellent paper in the *Swiss Militar Zeitung*. He was the real originator of the use of artillery in mass, for concentrated effect, which is the universal practice since 1870. The battles in Manchuria demonstrate that this principle, when intelligently applied, always gives good results, but Napoleon's application of it will long remain unrivalled. His massed artillery decided Austerlitz and later Bautzen. At Ligny the artillery of the Guard broke the enemy's center; at Mont St. Jean, Drouot's 72 guns not only prepared but accompanied the attack. So at Wagram the massed artillery decided the battle, and at Borodino it shattered the Russian columns of attack.

Napoleon's main attack was always begun and carried through by the infantry and artillery together. The cooperation of his different arms was always intelligent, and usually a model—which contributed not a little to the brilliant success of his tactics. His commanders knew how to secure this cooperation, and habitually did so. The power of both artillery and infantry, but especially of the latter, was thus greatly increased; and only in very recent years are we again beginning to demand as much in this way as he did.

In spite of the lessons of the war of 1870, and in spite of the faulty use of artillery before Pleuna and in South Africa, it was long before any of the Regulations contained a statement of the principles governing the combined use of infantry and artillery. Honig, with his clear, tactical insight, hit upon the true principles and explained them in his "Tactics of the Future." In 1870 the artillery was still looked upon as a technical arm; Honig insisted that it be placed as a sister arm, on the same footing as the infantry.

Formerly artillery was actually massed to secure unity of action; today the mass effect is secured by the cooperation of separate groups under one command. Honig insisted that infantry and artillery fire be used to supplement each other; that each arm must rely upon the other, and that both together must constantly work together for the same end, the gaining of a superiority of fires as the necessary condition of success. The artillery of a division should be so incorporated in it that infantry and artillery are tactically one; that the last gun is ready to fight for the infantry, and that each arm thoroughly understands the other. Honig believed that all officers from the very beginning of their service should be required to study the principles and the spirit of the others. To have generals of infantry, cavalry, and artillery, is not logical; we need only one kind of general, but they should be at home in any saddle.

In 1870-71 the handling of the German artillery was not uniformly good, but nevertheless conformed in general to modern ideas; from then until the time of the Manchurian campaign we find no instances of its scientific use.

The effect of the Russian artillery fire at Lovtcha and before Plevna was most unsatisfactory. At Lovtcha, Skobelev's 56 guns bombarded the Turkish positions for hours; it succeeded in silencing a few guns, but as soon as it ceased firing and the infantry advanced the Turks opened their rifle fire upon the Russian columns of attack unmolested. The same thing happened to General Dobrovolski's

column, except that here the Russian infantry was exposed to the fire of the Turks during the artillery preparation of the attack.

Before Plevna things were even worse. From the 7th to the 10th of September the Russian artillery bombarded the Turkish positions. The Turks had no difficulty in finding cover from the fire, especially as the range was from 3,000 to 4,000 m.; they had a few guns put out of action, but their own fire was not without effect. On the 11th eighty Russian battalions advanced to the assault, but only 45 out of 444 guns could support them; the rest had fired all their ammunition, or were out of action. And it is instructive to note that the Russian attack was successful at the one point where it had artillery support and failed everywhere else.

An instance of better handling of artillery is found in the attack of Prince Mirski's column at Shipka, on January 8, 1878. A mountain battery advanced with the 13th and 14th Rifle Battalions and supported the infantry attack; it then changed position, and by its effective fire determined the issue of the engagement. After occupying the enemy's position it held its own against superior Turkish artillery, and even against an offensive return by infantry. In this way Mirski's advance was made much more easily than Skobelev's farther west; his guns were unable to keep down the destructive fire of the Turkish artillery west of Shenovo.

The failure of the English artillery in the Boer war was also due to incorrect tactical handling. Buller's operations in Natal especially were faulty in this regard. The bombardments of the Boer positions at Colenso and Magersfontein, by heavy naval guns were utterly without effect; when the infantry advanced to the attack, the Boer rifle fire was found as strong as ever.

The artillery wasted much ammunition in firing upon position which were in fact not occupied. In the attack on Tabanama, six batteries fired for five hours upon the supposed Boer trenches. The result was zero; when the infantry tried to advance between Tabanama and Spion Kop, it came under a destructive cross fire from the Boers, reinforced by a few well posted guns. The best General Clery could do was to withdraw his brigade, under the protection of the artillery.

At Spion Kop, January 24, 1900, the English artillery, though much superior in numbers, could not cope with the seven Boer guns, which had much better positions, and which inflicted severe loss upon the British infantry.

At Paardeberg, February 18, 1900, the English batteries on Gun Hill could not keep down the rifle fire of the Boers on the banks of the Modder River, and so could not properly prepare the attack of the Highlanders and the 13th Brigade. The guns on the left could not be used effectively, and fired upon targets not related to the real point of attack, such as the Boer camp at Wolvekraal. In this battle, every principle of artillery tactics was disregarded. There was no unity of command, no attempt was made to get any mass effect, and the guns did not properly support the infantry.

Taught by this experience, the English artillery at Driefontein did its best to support the infantry attack. Although the batteries did not all work together, still two horse batteries northwest of Cattle Kraal Hill did hold the Boer artillery on Signal Hill in check; while it was only the fire of the 81st Battery upon the Boer infantry that enabled the 18th Brigade to gain the Boer advanced position. And not until the 81st and 76th Batteries, changing position to the front, had silenced the Signal Hill guns, did the Buffs, Welsh and Essex Regiments, supported by a heavy shrapnel fire from the same

batteries, succeed in taking the Boer position on Alexandra Hill.

Artillery and infantry should be inseparable; their action should be united, both in space and time. The value of a preliminary bombardment as preparation for the infantry attack should not be overestimated. Although the war in Manchuria indicated that the importance of artillery fire had increased 50 per cent since 1870, and even better results are to be looked for with better handling, still it will never be the predominant factor in battle, and the main reliance of the attack will continue to be upon infantry fire. The percentages of wounds from infantry and artillery fire, taking an average from all reports, seem to have been about 85 and 15; in 1870-71 they were 91.6 and 8.4.

Against inanimate targets the effect of artillery fire is not great; sufficient cover can always be found. Even its effect upon living targets should not be exaggerated. Much greater is its moral effect, and this must always be reckoned with. Artillery fire to prepare an infantry attack means nothing whatever. The defenders will let the projectiles go harmlessly over their heads or explode in the parapets, as did the Turks at Plevna and the Boers at Paardeberg; when the infantry advances they will occupy the position, and meet the attack unshaken by the artillery fire. It is essential, then, not to allow the action of the infantry and artillery to be separated, either in space or time.

Perhaps the Japanese would not go so far as this; their infantry attack did not always receive the intelligent support of the artillery, although it must be said that the co-operation of their different arms was very good indeed. Paragraph 186 of the new Japanese Drill Regulations says: "Proper cooperation of all arms is the secret of success. But the infantry is the principal arm, and it must strike the decisive blow. It must be able to fight the battle through, even when not supported by the other arms."

A typical instance of proper co-operation of infantry and artillery is found in the attack of the 2d Guards Division at St. Privat. The advance of the infantry was supported by the divisional artillery battalion and the 4th Light Battery of the Corps Artillery, which advanced from their position between Ste. Marie aux Chenes and St. Ail to within 1,800 meters of St. Privat. Later they again changed position, moving 400 meters to the front, and so enabled the infantry of the division to hold the ground it had gained and prepare for the assault on St. Privat. Toward evening, by order of General Pape, the corps artillery, southwest of St. Privat, opened fire upon the village; a little later, fourteen Saxon batteries at Auboue did the same. This fire, although it caused some casualties among the assaulting infantry, enabled it to take the village.

Here we find that the various artillery units instinctively worked together, even without a common commander, and twenty-five batteries united their efforts to one end. The co-operation of the infantry and artillery also was spontaneous; they supported each other, although without any means of intercommunication. If, however, the artillery could have gotten word from the infantry at the proper time, it could have avoided firing into it.

On this point the German Infantry Drill Regulations say: "The artillery must always be in touch with the advancing skirmish lines. Habitually artillery officers are sent forward, to communicate by signals. Their chief duty is to keep the artillery commander informed of the position of the skirmish lines, so that he may continue his fire as long as possible."

The Japanese regulations express the same idea thus: "When the attacking infantry approaches the hostile position, the officers in command at the front should keep the artillery commander, or the nearest artillery patrols, informed of the positions of the troops and of the fall of the projectiles, so as to permit of proper regulation of the artillery fire."

In general, the Japanese regulated this matter well. It is difficult to make satisfactory deductions as to artillery from the experience of the Russo-Japanese war, for on neither side were the horses or material up to modern requirements. The guns had neither spring spades nor recoil on the carriage, nor were they provided with shields, which of course greatly affected their tactical handling. But unquestionably the Japanese artillery deserves the highest praise, in that it supported its infantry at all times, and made the most of its material. Habitually it came into action in masses, and its fire was controlled and concentrated upon the point of attack.

On the Yalu, the Japanese heavy artillery southwest of Wiju silenced the Russian guns, but could not destroy them. Against infantry, the effect of the fire of preparation was slight; the troops remained under cover until the Japanese infantry advanced, and then occupied the trenches.

At Kin Chau the Japanese artillery, 198 guns, under one commander, prepared the attack, but did not sufficiently support it. This was better done at Wafangau, especially on the left. Here the Fourth and Fifth artillery advanced with the infantry of the Fifth Division; the fire was directed by flag signals. It soon silenced the First East Siberian Artillery brigade, and opened the way for the infantry. The shooting and the fire discipline of the Russian batteries was good, but they did not work together.

At Tashichiao the Russian artillery was perfectly concealed; the Japanese could not silence it, and it kept back the attack. At Yushulin the Russians made the mistake of holding back a large artillery reserve; to do this prevents the decisive massing of guns which is essential to success. The excuse that there is no suitable position can not be admitted. If the batteries can not be brought together in one position, at least separate groups can be so placed that all the guns can be used; and with the present equipment the separate groups can all be controlled by one commander.

At Lianoyang the fire of Colonel Slussarenko's two batteries was very skillfully conducted; from a concealed position, they silenced the Japanese batteries in less than half an hour. By personal observation, and the use of the plotting instrument and signal flags, he handled his fire so well that the Japanese attack was completely checked. On August 31st, the Japanese brought 234 field guns and twenty-one heavy batteries of position into action; these only partially prepared the attack, but gave it effective support.

At the Shaho, the Japanese artillery had gained sufficient confidence to continue its supporting fire until the advancing infantry gave the signal to cease by displaying the national flags; this fire made the Russians keep under cover. The infantry demanded the continuance of the fire until the skirmishers had actually entered the zone heated by the shrapnel.

As these few examples will indicate, the Russo-Japanese war has not fully cleared up all the questions relating to the cooperation of infantry and artillery. It is clear, however, that fire of preparation, so-called, is useless. The infantry can not wait for the artillery to complete its work; the enemy will not expose himself until the infantry advance commences.

The Japanese procedure at Liaoyang appears to have been a model. The Swiss Colonel Gertsch, in his report, says of the Second and Fourth Armies on September 2d: "It appeared to me that the infantry was held back only long enough to enable the artillery to locate the enemy's batteries, assign targets, and adjust the fire. This, in my opinion, is the only proper course in attacking a fortified position. The infantry can not wait until the effect of the artillery fire is perceptible; the expression 'silencing the enemy's guns' has lost its meaning. With the present artillery material and tactics guns can be silenced only in exceptional cases; it requires an overwhelmingly superiority and a long time. The guns of the defense may be forced

to turn their whole attention to the artillery of the attack, and so prevented from firing upon the advancing infantry, but that is all. The first object of the artillery of the attack is to locate the enemy's batteries and range on them; so as to be able to turn fire upon them at any moment. As soon as this is accomplished, the infantry should advance.

In a general order issued before the battle of Mukden, General Oku, taught by experience, urges that artillery fire and infantry advance must go together, not one after the other. He says: "Artillery fire is the best preparation for the attack. But merely throwing projectiles into the enemy's position is useless; the infantry must advance at the same time, even if its progress is slow. If the infantry can not advance, the artillery should wait for a time when such advance is possible before opening fire. Infantry advance and artillery fire must be simultaneous."

The Japanese regulations express the same idea in paragraph 238, saying that the infantry must advance during the artillery duel, and not wait until the duel is decided.

The Japanese artillery should not be condemned, as it sometimes is, because, although it was used in masses, it did not always get the results expected of it. Having no shields, the batteries were often compelled to use concealed positions when, to support the infantry properly, they should have come out into the open.

The system of communications worked very satisfactorily. Observers reported the fall of the shots by signal flags and telephones; the Japanese artillery masses could always be handled as units, and the fire concentrated upon the point of attack.

The experience of this war has nowhere been fully embodied in regulations. The German Infantry Drill Regulations, with last autumn's supplements, seem the most advanced; the Japanese regulations show some of the same influence. In paragraphs 329-30, the German regulations prescribe that during the infantry attack the artillery, while keeping the hostile batteries fully occupied, must concentrate as much of its fire as possible upon the point of attack; and that the infantry must advance during the artillery duel, and compel the enemy to expose his troops to the artillery fire. This is the same idea expressed in Oku's general order. Paragraph 371 prescribes that while superiority of artillery fire is desirable, the launching of the infantry attack must not be made dependent upon this alone, but upon all the existing conditions; the artillery duel is not entirely discarded, but such bombardments as took place at Plevna, Paardeberg and the Yalu are discountenanced. To secure unity of action, the assignment of a single commander for all the artillery is recommended.

A very important point is made in paragraph 446—that the attacking troops must expect the artillery to fire over their heads until just before the final rush; if the observation is poor, the fire is to be continued only until the first line has advanced to within 300 m. When the fire can no longer be continued upon the enemy's firing line, the ground just in the rear is to be swept, to prevent bringing up reserves. As recently as 1870, Prince Frederick Charles cautioned the artillery not to fire over the heads of the infantry, although the trajectory of the gun then in use was not by any means as flat as that of the present gun.

Paragraph 276 of the Japanese regulations makes it the duty of the infantry, without express orders, to support any artillery in its vicinity, the flanks and rear of artillery positions being particularly exposed to surprise by small hostile forces. As showing that this spontaneous support is essential, Colonel von Freytag-Loringhoven mentions the Ninth Corps before Metz on August 18th. The artillery of the Eighteenth Division and the corps artillery, in the position between the Bois de la Cusse and Champenois, had support only on the right. The effect of the Chassepot fire from the left was so

great that the batteries here had to be withdrawn. Ten companies were brought up in support, but long after the artillery had come into action, and had all they could do to hold back the enemy.

On the other hand, the artillery must be prepared to sacrifice itself for the infantry, as did von der Groben's battery at Chlum Lipa, when, to cover the retreat, it exposed itself to the fire of the needle gun at 200 m. In the same way at Liaoyang, a battery of the Third Siberian Corps remained in position to cover the retreat of the infantry until annihilated by the Japanese rifle fire.

Good results may sometimes be obtained by sending single batteries or even single guns forward with the infantry, both for moral effect and to guard against counter attacks. At Spichenen, on the Rother Berg, two batteries were used in this manner very effectively. At the Tanho, on August 26, a mountain battery advanced to the skirmish line of the Fourth Regiment, of the Japanese Second Division, and forced the Russians to retire. This use of artillery recalls the "battalion guns" of the time of Frederick the Great.

It would seem, however, that machine guns are better adapted for service of this kind. The Russo-Japanese war demonstrated that these weapons are an indispensable auxiliary, even in the attack. They can be used in positions that are out of the question for field guns. If they can be brought into action from an unexpected position, they may be remarkably effective, as at Wafangau, where the Japanese machine guns fired upon heavy Russian Columns at 2,300 m. At Liaoyang, Russian machine guns on the left flank caught a Japanese mountain battery in a millet field at 850 m., and destroyed it; and the attack of the 23d Regiment, of the Japanese 6th Division, was checked by Russian machine gun fire, and the regiment held stationary for twenty hours.

At Mukden, the 11th and 21st Regiments could make no progress in their attack upon Likiaowopeng and Wankiaowopeng until machine guns were pushed forward to the skirmish lines. The Russian machine guns were silenced by shrapnel fire from the mountain guns.

Machine guns were found very useful in repulsing counter attacks. General Oku recommends this use in his general order cited above. "But," he says, "the mechanism of these guns is delicate, and requires careful cleaning and oiling, and constant attention. Even the slightest injury must be repaired on the spot, no matter how critical the situation; hence these guns should never be isolated."

The Japanese assigned them singly or in pairs to battalions, and kept them on the firing line. In the pursuit, and in holding captured positions, they were invaluable. They were found so useful that Russia sent all the machine guns of her mobile army to Eastern Asia; and Japan increased her armament enough to give every battalion a gun. It would be very desirable for us also to increase the number of our machine guns, and assign them to infantry regiments.

No general rule can be given for the advance of infantry under artillery fire. The Russian columns were compelled to deploy at 7,000 paces or more from the Japanese batteries, and generally formed line of skirmishers. The Japanese used all kinds of formations, according to the ground. At Yoshirei companies advanced in column of platoons at 300 m. distance, each platoon in line of skirmishers at 5 paces interval. Sometimes the advance was by small deployed groups, keeping on the same general line; sometimes in line of platoons in column of squads, at 20 or 30 paces interval.

For this advance, and for the combined action of infantry and artillery, the only rule that can be given is that each commander, from the highest to the lowest, must be constantly on the alert to discover the best course for his unit in every emergency, and then follow it through with the utmost energy.

It has been remarked above that the regulations of the various armies have not yet felt the full influence of the teachings of the most recent wars as to the necessity of the close co-operation of the arms.

The French, however, even without any such requirements in their regulations, have of late practiced very extensively the maneuvers of the combined arms. Particularly noteworthy are the instructions given by General Percin, now of the Superior Council of War, when commanding the 13th Corps. This officer, who was promoted from the artillery, sought, in these instructions, to accustom the infantry and artillery to constant close co-operation. He ordered twenty field exercises of companies and batteries, conducted by captains of infantry and artillery, so as to accustom the smallest units to combined work and demonstrate its importance. He then ordered one such exercise for each regiment and each division. He further required that after the month of June, 1910, in all field exercises of a battalion or more, the artillery be outlined by infantry officers detailed for the purpose, representing battery commanders, agents of communication between the artillery and detachment commanders, and "orientation officers." This last term, a new one within recent years, is applied to officers of artillery, specially trained in infantry combat, who are attached to the staff of artillery commanders for the purpose of keeping their chiefs constantly informed of the progress of the action.

The last autumn maneuvers of the 13th Corps showed the results of this training. The progress of the maneuvers, it is true, was slower than formerly, for the reason that the infantry always waited for the active support of the artillery before undertaking any serious attack. But this slow progress and close co-operation were precisely the things that the corps commander was trying to get, for, as he justly said in his final discussion, this is the way it would have to be done in war.

The Minister of War approved all General Percin's measures, and ordered that exercises of this nature be held in all army corps. In further development of the same idea, General Brun ordered that corps commanders arrange to send infantry units, by rail if necessary, to suitable places for a day or two, for combined maneuvers and field firing. In this way ground can be selected which can be reached by infantry units from several garrisons, and cavalry and artillery sent there by marching. Additional opportunity is thus given for practice in field service by mixed forces, before the maneuvers.

The Minister has also approved the instructions issued by General Joffre, until recently commanding the 2d Corps, for the practical management of the service of communication in the infantry and artillery, and adopted them for provisional use by all troops. They require that, in addition to the present telephone and signal service, each infantry regimental and battalion commander shall assign a mounted officer with a mounted or cyclist orderly, and each company commander a sergeant, as agent of communication with the next higher commander. Each company commander is required to keep with him, for this duty, a corporal, a trumpeter, and one private from each platoon, and each platoon commander to designate one man whose sole duty is to watch for signals from the company commander.

In artillery communications, General Joffre's instructions distinguish between communications upward and downward. First, the artillery commander must be kept informed by the commander of the whole force, how the artillery is to support the infantry; secondly, the batteries specially assigned to support the attack must receive information as to the obstacles and resistance encountered by the infantry. The use of both mounted messengers, and telephone and signal details, is provided for.

Finally, the Minister has issued an order, intended to favor the co-operation of the two arms. It provides that the details of lieutenants, of not less than six years service and not more than thirty-six years of age, for duty with arms other than their own, shall hereafter be extended to periods of nine months, and shall be made in greater

number; that captains be detailed from units not stationed in mixed garrisons, to serve for periods of not less than a month with other arms—with artillery during the season of firing practice, and with other arms shortly before the autumn maneuvers: and finally, that during field exercises of all kinds, officers of different arms serving at the same station exchange places as frequently as possible. In this connection it is interesting to note that one of the principal reasons given by the Minister of War for the recent transfer of 150 lieutenants of infantry to the artillery was that these officers, thoroughly familiar with the methods of infantry combat, would greatly assist in getting co-operation between the two arms.

Some interesting remarks on this subject were contained in the final comments of General Tremeau on the army maneuvers conducted by him last year in the Bourbonnais. He said that he had noticed that separate columns almost invariably kept up communication on the march, but frequently lost it entirely as soon as they began to deploy for action. He considers it one of the most important duties of the divisional cavalry to see that this does not happen; but adds that the maintenance of communication is necessary, not only between different arms, but between individual units, no matter how small. As one means to this end, he recommends that the headquarters of general officers, and especially of corps commanders, be not moved during the course of an engagement except in unusual cases. If it is necessary for the general himself to leave the spot for a time, he should do so with only such officers as he requires, leaving most of his staff at headquarters. Work may then go on without interruption, and there will be no danger of important messages going astray because the officer addressed has left his post.

We have more maneuver grounds than the French, twenty to their eight, and a larger part of our infantry, together with all our field artillery, has access to them every year; but the two arms are not habitually combined for maneuvers and field firing. Unpleasant as it may be to crowd mixed units, infantry brigades and artillery regiments, into these camps for such exercises, it is the only way to teach a proper co-operation of these arms, and we should not permit ourselves to be left behind by the French in this matter.

The preceding remarks have dealt almost exclusively with the necessity for co-operation between infantry and artillery, they being the principal arms and the main reliance on the battlefield. It is not, however, meant that the cavalry may be neglected, or that it is not entitled to as high a place as its sister arms. It is much disputed today what its role in future wars will be; whether, in view of the effect of modern firearms, it will take an active part in great battles, or have to limit itself to the services of information and security, to operations in the enemy's rear, and to co-operation in the pursuit. This is not the place to discuss this question. Whatever duties may fall to the cavalry, in front or on the flanks of the army, in action, on the march or in camp, it must always keep in touch with the other arms and look upon itself as a part of the whole. Especially will this be the case in battle. Here the cavalry must be constantly in touch with the commander of the whole force; keep informed of the progress of the action; find out where its help is needed—where the sister arms require support and where it may have an opportunity to participate in a victory or ward off danger.

In all cases the personality of the cavalry commander will play an important part; upon him will depend the close co-operation of the cavalry with the other arms. But the troops themselves must be properly trained; they must understand the tactics of infantry and artillery and how these two arms support and assist each other. Then the cavalry will see what its own part in the combined action must be.

Recognizing this principle also the French have taken a long

step in advance by assigning infantry companies or battalions to take part in the annual maneuvers of the cavalry divisions with their horse batteries. It is evident that this must be of the greatest

assistance in developing the great principle—the co-operation of all three arms.

“MODERN GUNS AND GUNNERY”

A practical manual for officers of the Horse, Field, and Mountain Artillery, by Colonel H. A. Bethell, R. F. A., published by F. J. Cattermole, Wellington street, Woolwich.

Colonel Bethell in his preface to this third edition of his excellent work remarks that only three years have passed since the last edition of the book was issued and yet the changes which have taken place have rendered it necessary to rewrite the book throughout.

The 1910 edition of the work covers, clearly and thoroughly, many of the subjects which must be mastered by the modern field artillery officer before he can efficiently perform his duties. Not the least value of the work lies in the fact that it is one of the very few books on modern field artillery published in the English language. There is a wealth of literature on this subject published in the French, German, and other languages; but comparatively few of these books are available to an officer who reads only English.

The scope of the book is indicated by its table of contents:

- Part I. Theoretical Gunnery.
- Part II. Principles of Construction of Guns, Carriages, and Ammunition.
- Part III. Practical Gunnery.
- Part IV. Modern Quick-Firing Equipments.
- Part V. Gunnery Calculations.

An idea of the utility of the work can be obtained from Part I, Chapter V, Accuracy of Fire, where examples, interesting to artillery officers who know the 50% rectangle of their guns, are given to show what results may be expected in fire. Thus:

Example 2. What is the chance of dropping a shell into a rectangular gun emplacement 3 yards wide, 5 yards from front to rear, with the 18 pr. Q. F. at 3,500 yards?

Assume the parapet revetted vertical, and 3' high. Then since angle of descent (from range table) is about 1 in 6, a parapet 1 yard high will cover 6 yards to the rear, and it will be impossible to get a shell into the emplacement without going through the parapet. Suppose that a shell striking the superior slope within one yard of the crest will penetrate the parapet, then our target is reduced to a surface 3 yards wide by one yard from front to rear.

Now, the 50% rectangle of the 18 pr. Q. F. at 3,500 yards is 1.75 yards wide; 3 yards over 1.75 yards is 1.7, which factor we find opposite 75% in the table, so that 75% of the shots will be correct for line.

Again, the 50% rectangle of the 18 pr. Q. F. at 3,500 yards is 26 yards long; 1 over 26 is .038, or just short of factor .04 in the table, so that 2% of the shots will be correct for elevation.

2% of 75% is 1.5% nearly.

So that in 100 shots, under ideal conditions, we may expect to put 1.5 effective shell into the emplacement.

Again, Part II, Chapter XIX, The Quick-Firing Field Howitzer, Probability of Hitting:

Example: How many rounds of lyddite shell from the 5 inch B. L. howitzer with full charge will be required to make one hit on a field casement 20 yards wide and 10 yards deep at 3,500 yards,

presuming the range and line already found?

From the range table, the breadth of the 50% zone is 4.74 yards, depth 32.6 yards. Then the 100% zones are four times as large. Four times 4.74 is 18.96; therefore all the shell will be correct for line.

As regards depth, $10-326 = .3$ nearly; opposite to factor .3 is the probability table we find 16%. Therefore all the shell will be correct for line, and 16% of them correct for range.

Therefore, after range and line have been correctly found to the center of the target, we may expect to obtain 16% of hits, or 1 hit every 6 rounds.

This assumes ideal conditions for practice, and absence of wind or other disturbing factor.

Under service conditions in war the probable rectangle would be nearly twice that given in the range table.

Part III, Practical Gunnery, contains excellent suggestions and demonstrations, especially on the subject of the bullet cone and shrapnel.

In this part of the book, under the heading. Indirect Laying, the following normal procedure in coming into action is given:

Under normal conditions the procedure from start to finish will be as follows:

1. Battery Commander receives his orders, reads them to officers, battery staff, and Nos. 1 and informs them where he intends to go.
2. He advances with Staff as in Fig. 93. (Note.—The Staff now follow as a closed body. See F. A. T., 1908, page 186.)
3. He arrives at his position, reconnoitres the enemy, selects his observing position, the position for the battery, and the general direction of position for limbers.
4. He proceeds to the observing position, where the rangetakers have in the meantime set up the director and are taking the range. He sends the horseholders to mark for the flanks of the battery.
5. The two signallers lay out the telephone wire from the observing position of the battery, working from the center outwards.
6. The battery leader gallops up, followed by his signaller; the B. C. points out to him the position of the battery and the direction of the target.
7. The battery leader brings the battery into action as in Fig. 94. The limbers proceed toward the position selected by the Battery Commander.
8. In the meantime the B. C. measures the angle of sight and sends it down to the battery. He also sends down the approximate battery angle.
9. The rangetakers having in the meantime taken the range to the target and to the battery, the B. C. works out the battery angle and the range with the plotter. He sends down the correction to the approximate battery angle (“all guns $1\frac{1}{2}^\circ$ more right.”)
10. The B. C. orders the ranging section, the nature of shell, and the corrector, and sends down the two elevations to the ranging section.

11. The ranging rounds are fired, and the B. C. holding his deflection

scale at arm's length, measures the angle of the fall of the shots right or left of the target. He sends down the deflection correction and orders a fresh elevation or elevations. ("All guns 30' more right. 4,500-4,600.")

12. The B. C. orders a further deflection correction if necessary, and a fresh elevation. If the target is bracketed he orders a fuse echelon.

13. On the result of the echelon the B. C. gives the corrector setting and the final elevation, and orders the method and rate of fire.

14. Should the target be visible guns, the B. C. orders "corrector—one round battery fire 10 seconds." He notes the error of each gun, which is recorded by the signaller. He sends down the six corrections thus: "Number 1, line. Number 2, 10 minutes more left. Number 3, 30 minutes more left. Number 4, doubtful. Numbers 5 and 6, line. Fire Number 4 again."

15. Number 4 gun having been fired again, the B. C. gives "Number 4, 50 minutes more right. Section fire 10 seconds."

16. To switch on a fresh target, the B. C. orders "Empty guns. Angle at sight 1° elevation. All guns 7° more right. Ranging section 3,800-4,100.")

The procedure is then as before, except that, the error of the day of the fuse having been determined, there is no necessity to fire a fuse echelon.

The above procedure may appear complicated. But if every detail of it has been so thoroughly practiced as to make it a matter of routine, like harnessing up a horse, the whole operation will go off smoothly and with less mental strain to all concerned than one of our old drill evolutions, such as "change from right back on number 4."

There is one point which should not be forgotten, and that is the concealment of the B. C. and his Staff—the "brain of the battery." Under ordinary tactical conditions the enemy will probably be able to locate the battery, though invisible, within, say, a quarter of a mile. Then enemy will keep a bright lookout for the B. C. and will fire on any likely observing point. It is therefore advisable for the B. C. not only to keep under cover, but to avoid selecting any conspicuous observing position. It by no means follows that the point at which the director is set up is the best position to observe from.

The chapters on Ranging, Finding the Fuse, and Field Howitzer Fire, are all exceedingly interesting. So, also, is the chapter on Analysis of Practice Reports. In this latter case, by the use of probability tables, the range as determined by the guns is checked up, and errors in observation are also determined in the illustration given. The remarks of the brigade commander and camp commander are somewhat caustic.

Part IV. Modern Quick-Firing Equipments, contains brief descriptions and many illustrations of the present guns and howitzers of most of the countries of the world.

The entire book is of such interest that it should find its way into the hands of every field artillery officer, or at least be placed in the library of every post where field artillery is serving.

Editor's note: Due to space considerations, the 1911 issue, of *The Field Artillery Journal*, could not be reproduced in its entirety, however it can be viewed at, sill-www.army.mil/firesbulletin/archives/
